

# ***Color Camera Module***

## **SPECIFICATIONS**

|                 |                      |                 |
|-----------------|----------------------|-----------------|
| <b>MODEL</b>    | <b>SCC-ZM395</b>     |                 |
| <b>DATE</b>     | <b>Nov. 01. 2009</b> |                 |
| <b>CUSTOMER</b> |                      |                 |
| <b>APPROVED</b> | <b>SUPPLIER</b>      | <b>CUSTOMER</b> |
|                 |                      |                 |



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| Date        | Version | Description                    |
|-------------|---------|--------------------------------|
| '09. 09. 13 | 0.1     | Establishment (for R&D sample) |
| '09. 10. 01 | 1.0     | Mass Production                |
| '09. 11. 01 | 1.1     | Protocol changed and fixed     |

## 1. Features

### ■ 1/4" 410K/470K Sony Ex-View-HAD Double Scan CCD

**Power Zoom Optical 39x (3.4~132.6mm), Digital 12x(0.1step)**

**Minimum illumination 1.2 Lux (F1.6/WIDE, 50 IRE, Color, Sens-Up Off)**

**S/N Ratio 52 dB**

### ■ High Resolution : more than 560(Color)/600(BW) TV Lines

This camera has realized high resolution of 560(Color)/600(BW) TV lines using the top-notch full digital image processing, 12 Bit A/D serial signal processing and special algorithm technologies.

### ■ WDR (Wide Dynamic Range)

WDR extends the contrast range as it takes a picture of each of dark and bright areas before compositing the two, which is useful if you take a picture of windows inside a building. Namely, it improves the picture quality of the outdoor scenery as well as indoor.

The contrast enhancer sustains the effective contrast range and expands Dynamic Range up to 128x[NTSC] and 160x[PAL]

### ■ DNR (Digital Noise Reduction, 2D+3D)

The DNR technology eliminates noise thus generating a distinct and clear image.

This camera DNR function utilizes both an adaptive 2D filter reducing noise in the brightness of the image and an adaptive 3D Filter reducing noise caused by movement.

### ■ DAYNIGHT (with DAYNIGHT Filter Assy)

This camera has the DayNight function which outputs the filter changing signal with detecting the illumination condition.

DayNight operation feature an 'auto' mode which switches between day and night mode automatically based upon the level of illumination on the scene.

And also, the COLOR mode operates in daytime conditions to provide optimum colors, and B/W mode operates in night-time conditions to enhance the definition of the image.

### ■ CCVC (Camera Control Via Coaxial cable)

This is a remote control function that overlaps the coaxial cable (for a transfer of the video signal) with the control signal. In installation or repair, this helps you control the communication controller (optional) without additional cabling. ※Coaxial Controller (Option)

### ■ Intelligent Video (Moved/Fixed)

This Camera provides built-in capability for video content analysis. Operational modes include fixed mode (appear the object) and moved mode (disappear the object).

## 2. Precautions

- Avoid aiming the camera directly towards extremely bright objects such as sun, as this may damage the CCD image sensor.
- Do not use the camera in the extreme environments.
  - Extremely hot or cold place such as radiators, heat registers  
(Operating condition  $-10^{\circ}\text{C} \sim +50^{\circ}\text{C}$ , under 90% humidity)
  - Close to generators of powerful electromagnetic radiation.
  - The place which is subject to light reflections, unstable lighting conditions, strong vibration.
- Remove dust or dirt on the surface of the CCD with a blower.
- Do not apply excessive voltage. (Operating Power Input : DC 9V ~ 15V)
- The following phenomena that may appear in images are specific to CCD.  
They do not indicate malfunctions.
  - White Flecks : The fleck especially tend to be seen when operation at a high environmental temp. or when you have raised the master gain and use in sense-up function.
  - Vertical Smear : When an extremely bright object, such as a strong spotlight or flashlight, is being shot, vertical tails may be produced on the screen, or the image may be distorted.
  - Alias : When fine patterns, stripes, or lines are shot, they may appear or flicker.
- Do not drop objects on the product or apply strong blows to it.
- Do not install the unit in humid, dusty, or sooty locations.  
Doing so may cause fire or electric shock.

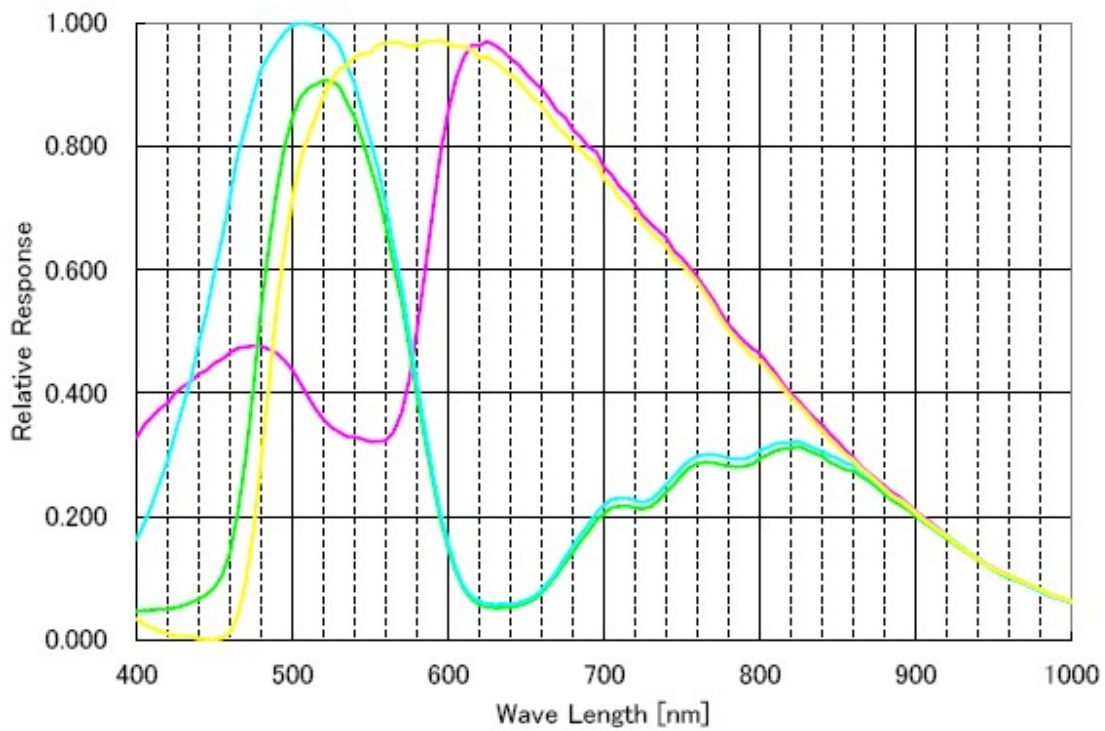
### 3. Specifications

#### 3-1. CAMERA Module Spec.

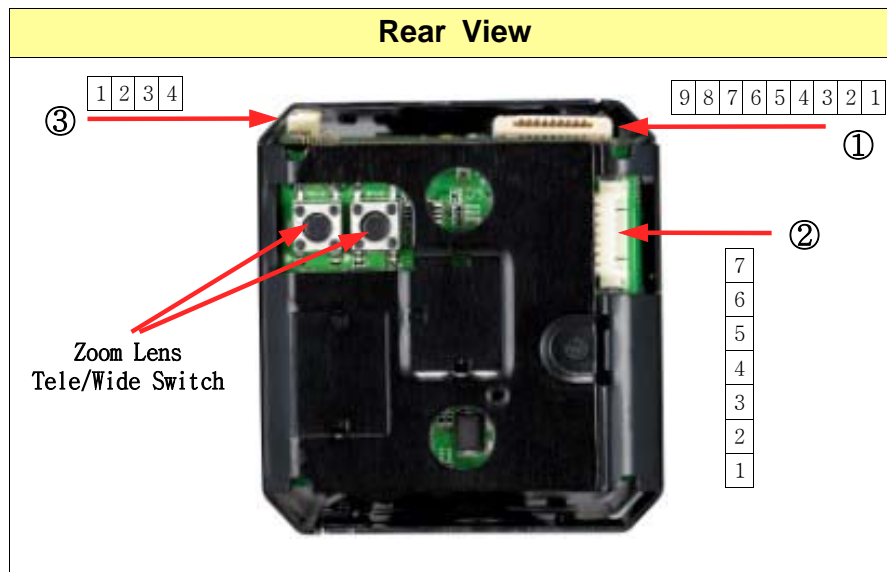
| Items                 | Sub-items                           | SCC-ZM395N  | SCC-ZM395P                               |               |               |
|-----------------------|-------------------------------------|---|--|---------------|---------------|
| CCD                   | Device                              | SONY 1/4" ExView-HAD<br>PS CCD (ICX-448)                              | SONY 1/4" ExView-HAD<br>PS CCD (ICX-449) |               |               |
|                       | Total                               | 811 x 508   | 795 x 596                                |               |               |
|                       | Effective                           | 768 x 494   | 752 x 582                                |               |               |
| Sync.                 | Inter. H/V                          | 15,734/59.94Hz  | 15,625/50Hz                              |               |               |
|                       | LL H/V                              | 15,750/60Hz   | 15,625/50Hz                              |               |               |
| Performance           | Horizontal/Verical Resolution       | more than 560(Color)/600(BW) TV Lines                                 |  |               |               |
|                       | Minimum illumination<br>(F1.6/Wide) | <b>Color mode</b>   | <b>50 IRE</b>                            | <b>25 IRE</b> | <b>15 IRE</b> |
|                       |                                     | Sens Off  | 1.2 Lux                                  | 0.6 Lux       | 0.36 Lux      |
|                       |                                     | Sens x256   | 0.004 Lux                                | 0.002 Lux     | 0.001 Lux     |
|                       |                                     | <b>BW mode</b>  | <b>50 IRE</b>                            | <b>25 IRE</b> | <b>15 IRE</b> |
|                       |                                     | Sens Off  | 0.12 Lux                                 | 0.06 Lux      | 0.036 Lux     |
|                       |                                     | Sens x256   | 0.0004 Lux                               | 0.0002 Lux    | 0.0001 Lux    |
| S/N Ratio             | 52dB                                |   |  |               |               |
| Lens                  | focal length, F number              | f=3.4~132.6mm, F1.6(Wide)/F3.7(Tele)                                  |  |               |               |
|                       | Drive Type                          | Auto (DC)   |  |               |               |
|                       | M.O.D.                              | Wide: 0.2m , Tele: 0.8 m  |  |               |               |
|                       | View Angle                          | Tele: 1.56°(H) x 1.16°(V), Wide: 57.54°(H) x 44.44°(V)                |  |               |               |
| Functions             | OSD                                 | E/F/S/J/P, (E/K) E/F/G/S/I, (E/R/Po/T/Cz), (Chinese)                  |  |               |               |
|                       | Privacy Zone                        | 12ea (Square)   |  |               |               |
|                       | Day&Night                           | COLOR/BW/AUTO (with D/N Filter Assy)                                  |  |               |               |
|                       | Motion Detection                    | Off/On(1ea) ※Mask Area 4ea  |  |               |               |
|                       | D-Zoom                              | x1~x12 (x0.1STEP)   |  |               |               |
|                       | High Speed Shutter                  | 1/60(1/50) ~ 1/10Ksec   |  |               |               |
|                       | Flickerless                         | Off/On  |  |               |               |
|                       | Sens Up (Low Shutter)               | x2 ~ x256   |  |               |               |
|                       | BLC                                 | Off/On (Area Setting)   |  |               |               |
|                       | AGC                                 | Off/On (Max.Level Setting)  |  |               |               |
|                       | ALC (Auto Level Control)            | Auto(DC)/Manual(Level Control)  |  |               |               |
|                       | Line Lock                           | Off/On (Phase Control)  |  |               |               |
|                       | Camera ID                           | Off/On (Max. 54ea/2Line)  |  |               |               |
|                       | White Balance                       | ATW1/ATW2/AWC/MANUAL<br>(ATW1: 2,500 ~ 9,500°K, ATW2: 2,000~10,000°K) |  |               |               |
|                       | DNR                                 | Off/On (Adaptive 3D+2D)   |  |               |               |
|                       | DIS                                 | Off/On  |  |               |               |
|                       | PRESET                              | Off/On (256ea)  |  |               |               |
|                       | WDR                                 | Off/On (x128/NTSC, x160/PAL)  |  |               |               |
|                       | Intelligent Video                   | Yes (Moved/Fixed)   |  |               |               |
|                       | Etc. Function                       | Detail, Reverse(H/V), Posi/Nega, PIP                                  |  |               |               |
| In/Output             | Alarm Output                        | 1 ea(Open Collector)  |  |               |               |
|                       | Remote Control                      | UART(Txd/RXd, 3.3Vp-p), CCVC(with SCX-RD100)                          |  |               |               |
|                       | Video Output                        | VBS 1.0V p-p (75ohm Terminated)                                       |  |               |               |
| Power                 | Power Input                         | DC+9V ~ 15V   |  |               |               |
|                       | Power Consumption                   | about Normal~Max. 280~330mA (DC12V)                                   |  |               |               |
| Operating Temperature |                                     | Absolute : -10°C ~ +50°C  |  |               |               |
| Operating Humidity    |                                     | Less than 90%   |  |               |               |
| Dimension, Weight     |                                     | 51.0(W) x 55.0(H) x 98.0(D) mm, about 230g                            |  |               |               |

### 3-2. Spectral Response Spec.

#### CCD (ICX448AK/449AK)



### 3-3. Hardware Spec.



① CN207 : I/O Connector-1

| Pin NO           | Pin Name | Description   | Normal | Active | I/O |
|------------------|----------|---|--------|--------|-----|
| 1                | RxD      | Read Data<br>CMOS 5V (Low: Max 0.8V, high:min.3V)   |        |        | I   |
| 2                | TxD      | Send Data<br>CMOS 3.3V (Low: Max 0.1V, high:min.2V) |        |        | O   |
| 3                | GND      | Ground (for TxD/RxD)                                |        |        | -   |
| 4                | DC IN    | Power input (DC +9V ~ +15V)                         |        |        | I   |
| 5                | GND      | Ground (for DC IN)                                  |        |        | -   |
| 6                | VBS      | Composite Video Output                              |        |        | O   |
| 7                | GND      | Ground (for VBS)                                    |        |        | -   |
| 8                | LPULSE   | Line Lock Control Clock                             |        |        | I   |
| 9                | GND      | Ground (for VBS)                                    |        |        | -   |
| Molex 52207-0960 |          |   |        |        |     |

② CN3 : Connector for upgrading Camera Program (\* used for factory only)

| Pin NO                            | Pin Name | Description                     | Normal | Active | I/O |
|-----------------------------------|----------|---------------------------------|--------|--------|-----|
| 1                                 | FSPE     | JTEG Upgrade Mode Setting       | +3.3V  | 0      | I   |
| 2                                 | DSPSCK   | JTEG Upgrade Clock              |        |        | I   |
| 3                                 | DSPSDO   | JTEG Upgrade Data Output        |        |        | O   |
| 4                                 | DSPSDI   | JTEG Upgrade Data Input         |        |        | I   |
| 5                                 | DSPSTB   | JTEG Upgrade Chip Selector      |        |        | I   |
| 6                                 | GND      | Board Ground                    |        |        | -   |
| 7                                 | V+3.3V   | JTEG Jig Power Supply(Max 0.2A) |        |        | O   |
| Yeonho Electronics, 12505WS-07A00 |          |                                 |        |        |     |

③ CN208 : Connector for communication (\* used for factory only)

| Pin NO                            | Pin Name | Description                | Normal | Active | I/O |
|-----------------------------------|----------|----------------------------|--------|--------|-----|
| 1                                 | V+5V     | Jig Power Supply(Max 0.2A) |        |        | O   |
| 2                                 | TXD      | UART (Txd)                 |        |        | O   |
| 3                                 | RXD      | UART (Rxd)                 |        |        | I   |
| 4                                 | GND      | Board Ground               |        |        | -   |
| Yeonho Electronics, 12505WS-04A00 |          |                            |        |        |     |

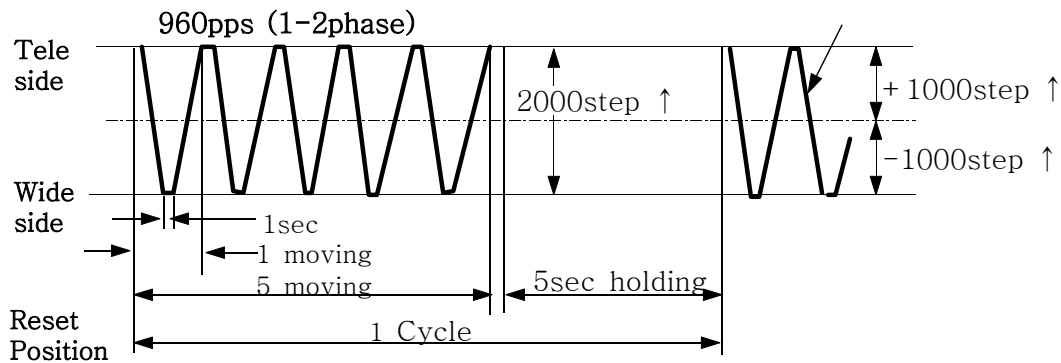


## ① Video Amp Block

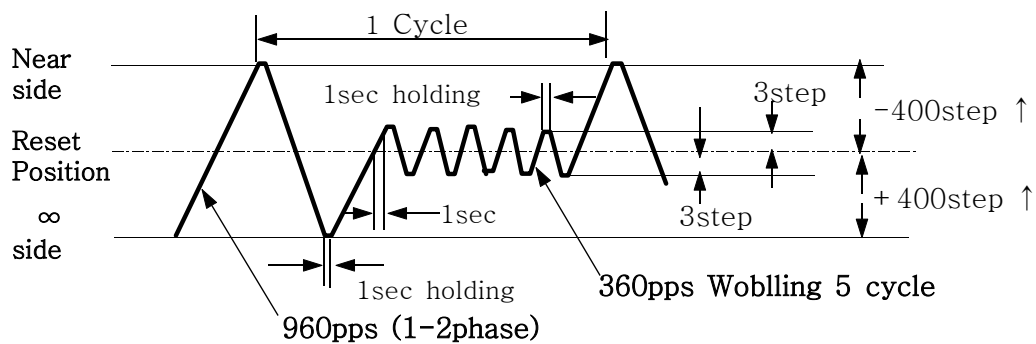


### 3-5. Reliability Zoom Lens

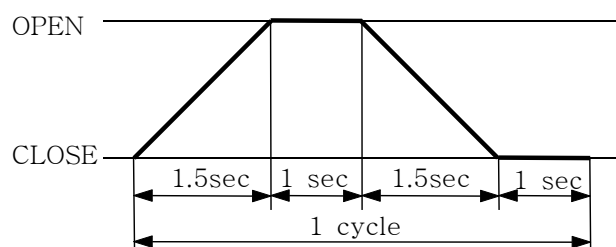
#### ① Zoom Operation : more than 500,000 times



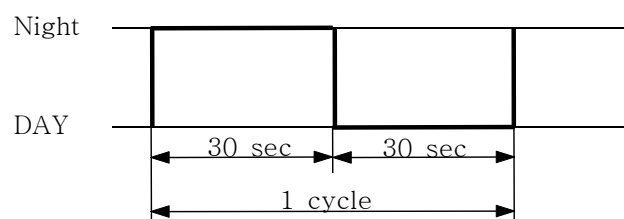
#### ② Focus Operation : more than 500,000 times



#### ③ AUTO IRIS Operation : more than 500,000 times

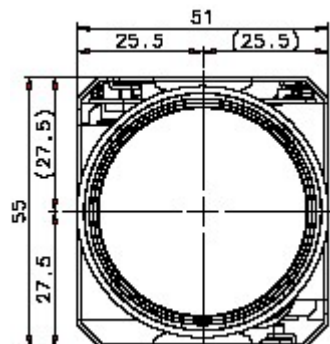


#### ④ Day/Night Operation : more than 50,000 times

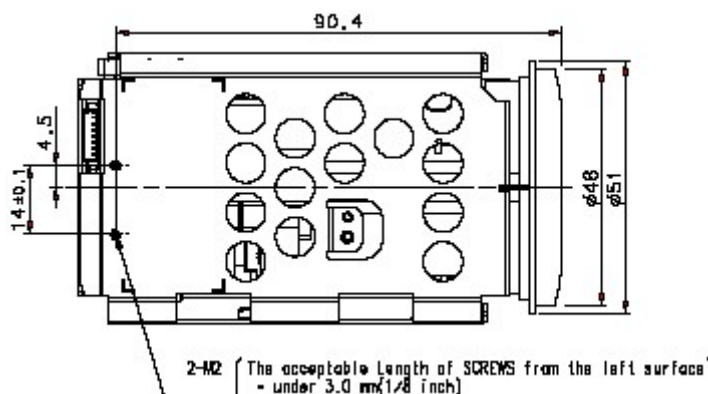


### 3-6. Dimension

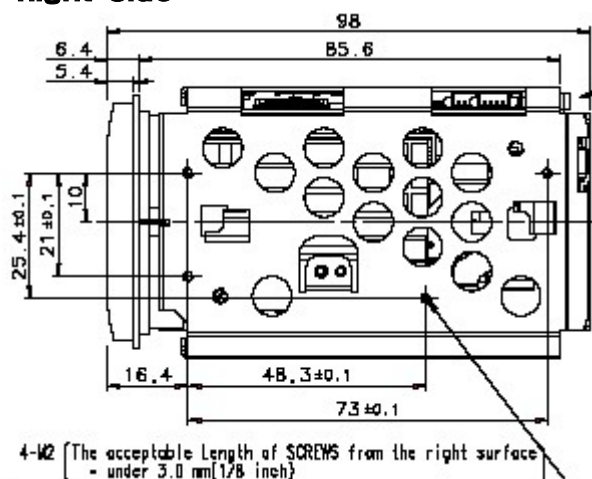
**Front**



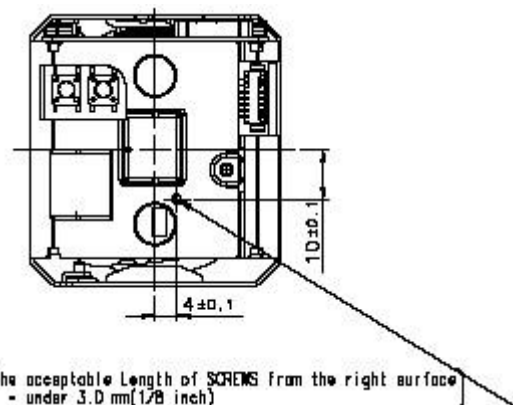
**Left Side**



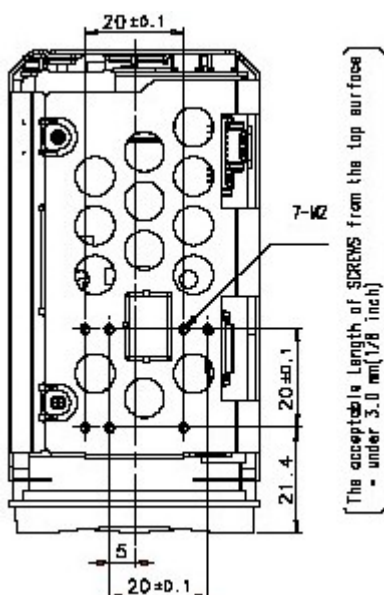
**Right Side**



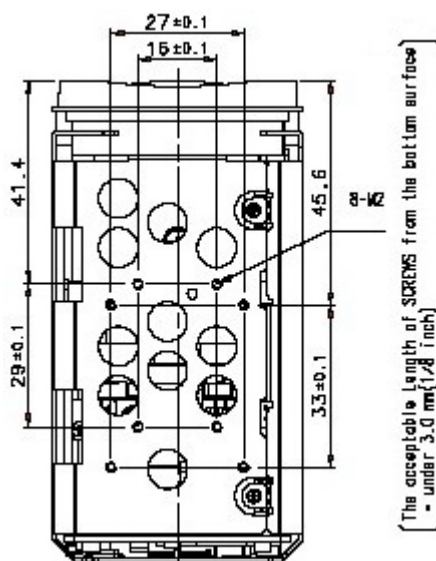
**Rear**



**Top Side**

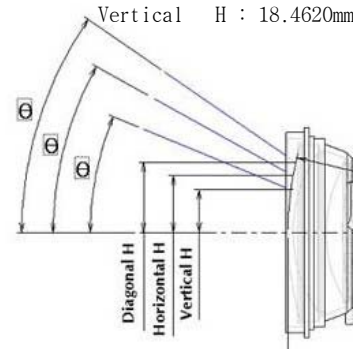


**Bottom Side**

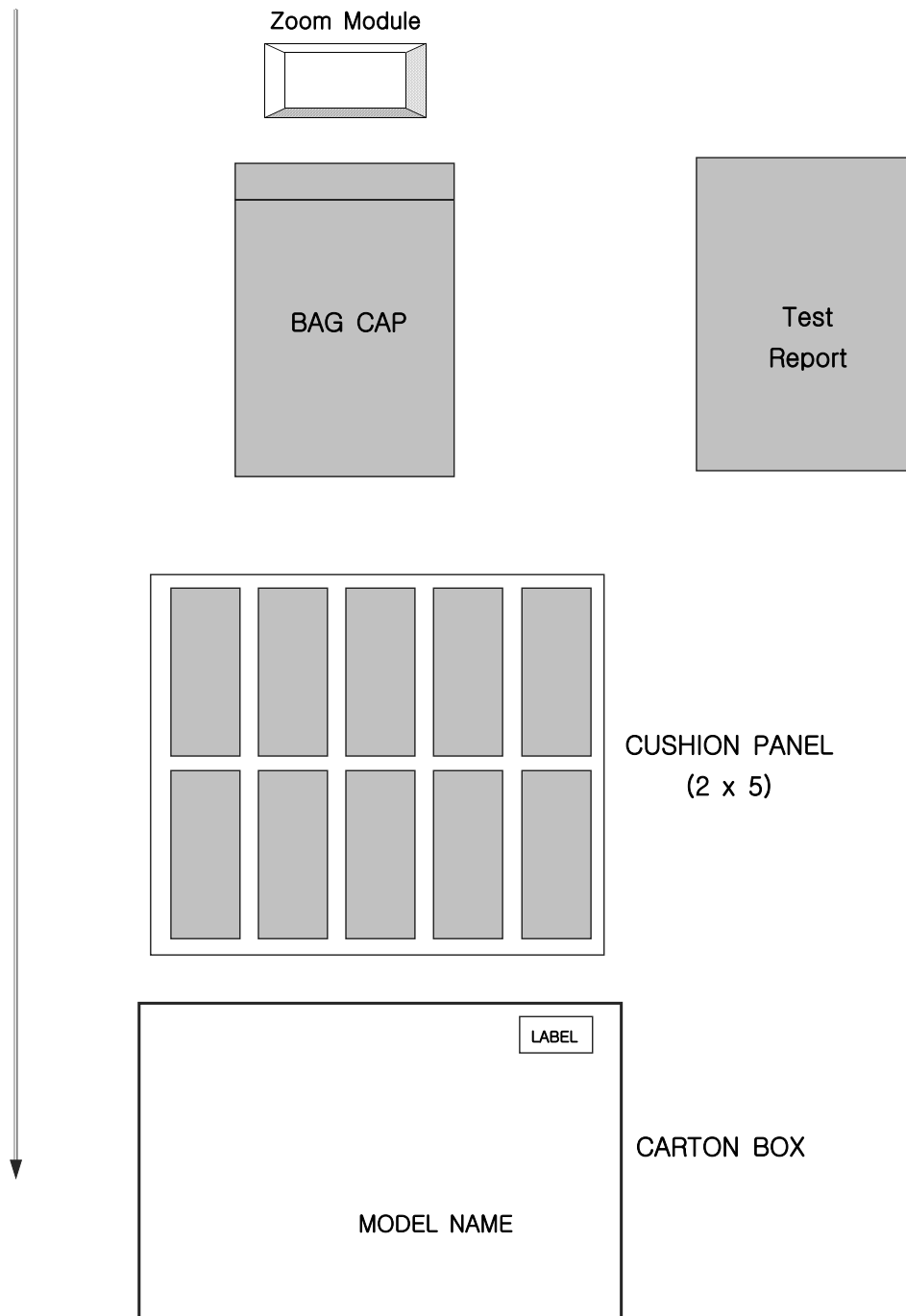


#### Lens Effective Angle

Diagonal H : 20.9 mm  
Horizontal H : 18.9576mm  
Vertical H : 18.4620mm



### 3-7. Packing Specifications (1 Carton = 10 ea)



## 4. Function

### 4-1. OSD MENU Structure

| MAIN MENU     | Description                               |
|---------------|---|
| CAMERA SET    | Camera related functions and data.        |
| INTELLIGENCE  | Motion detection, and more.               |
| PRIVACY ZONE  | Privacy related settings                  |
| PRESET SET    | Preset position and Preset ID             |
| OTHER SET     | Configure for Factory Defaults, and more. |
| COMMUNICATION | Communication set.                        |
| SYSTEM INFO   | Displays the system information.          |
| LANGUAGE      | Select a language on the OSD menu.        |

| CAMERA SET    | Description  |
|---------------|--|
| CAMERA ID     | ON/OFF, Make the camera ID and set the place. 54 characters.(2 line) |
| IRIS          | ALC/MANUAL Iris select. Setting the BLC and WDR function.            |
| AGC(MOTION)   | Setting the Max Gain under the low light.                            |
| DNR           | Digital Noise Reduction function                                     |
| SHUTTER       | Set the shutter speed. (High shutter speed)                          |
| SENS-UP       | Set the shutter speed. (Slow shutter speed)                          |
| FLICKERLESS   | Shutter speed : NTSC(1/60 → 1/100sec), PAL (1/50 → 1/120sec)         |
| DAY/NIGHT     | DayNight Mode (COLOR/BW/AUTO), Level set.                            |
| WHITE BAL     | White Balance Mode (ATW1/ATW2/AWC/MANUAL)                            |
| FOCUS MODE    | Select the Focus Mode: MF, ONEAF, AF                                 |
| ZOOM SPEED    | ZOOM Speed set   |
| DISPLAY ZOOM  | ZOOM RATIO display   |
| DIGITAL ZOOM  | Digital Zoom ratio set (x1 ~ x12 : x0.1 step)                        |
| DETAIL        | Aperture gain set  |
| V-SYNC        | Internal/Linelock mode set   |
| AGC COLOR SUP | Color suppression amount at the AGC function                         |
| REVERSE       | Horizontal/Vertical Reverse  |
| POS/NEGA      | Positive or Negative Video output set                                |
| PIP           | Picture In Picture at Digital Zoom operation                         |
| DIS           | Digital Image Stabilization set                                      |

| INTELLIGENCE | Description                                      |
|--------------|--|
| MOTION       | Motion detection function                        |
| ADVANCED     | Advanced Motion detection function (Moved/Fixed) |
| MASK AREA    | Set the motion detection exception area          |
| DISPLAY      | Motion Detection display ON/OFF                  |
| SENSITIVITY  | Motion Detection sensitivity                     |
| RESOLUTION   | Motion Detection resolution                      |
| ALARM OUT    | Alarm out set                                    |

| PRIVACY ZONE | Description                                |
|--------------|--|
| PRIVACY SET  | Set the privacy zone                       |
| STYLE        | Set the privacy style (Mosaic, Color, etc) |

| PRESET     | Description            |
|------------|------------------------|
| PRESET SET | Set the preset (0~255) |

| OTHER SET        | Description                     |
|------------------|---------------------------------|
| FACTORY DEFAULTS | Set the Factory default setting |
| OSD COLOR        | OSD menu color set              |

| COMMUNICATION                | Description  |
|------------------------------|--------------|
| PROTOCOL, BAUD RATE, ADDRESS | Protocol set |


| SYSTEM INFO | Description                |
|-------------|----------------------------|
| SYSTEM INFO | Camera setting Information |


  


| LANGUAGE | Description                     |
|----------|---------------------------------|
| LANGUAGE | select the language of OSD menu |


## 4-2. Function (OSD)


### □ USING ICONS IN THE MENU


- ◆ 


If these icons appear in the left and right corner of a menu item, you can use the joystick to move to the previous or next menu.
- ◆  **(EXIT)**

Exit the menu setting. Before you exits the menu setting, select SAVE to save your settings, or select QUIT to cancel.
- ◆  **(RET)**

Return to the previous menu.
- ◆  **(HOME)**

Return to the main menu.
- ◆  **(SAVE)**

Used to save your settings of MASK AREA, PRIVACY ZONE and more. Once you save your settings, they will remain even if you select QUIT in the menu.
- ◆  **(DEL)**

Used to delete your settings of MASK AREA, PRIVACY ZONE and more. Once you delete your settings, they will not be restored even if you select QUIT in the menu.
- ◆ 

This icon appears in the right of a menu containing sub menu items.

### □ MAIN MENU

- ◆ **CAMERA SET**

Configure Camera related functions and data.
- ◆ **INTELLIGENCE**

You can configure the settings of motion detection and more.
- ◆ **PRIVACY ZONE**

You can configure the privacy related settings.
- ◆ **PRESET**

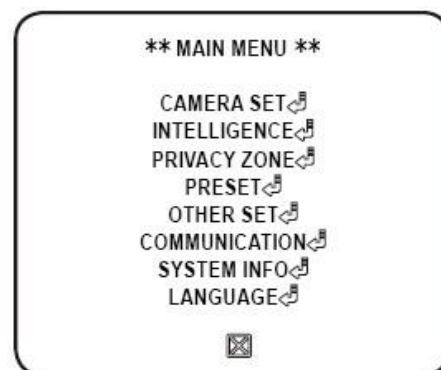
You can set the PRESET POSITION.
- ◆ **OTHER SET**

You can configure for Factory Defaults, and more.
- ◆ **COMMUNICATION**

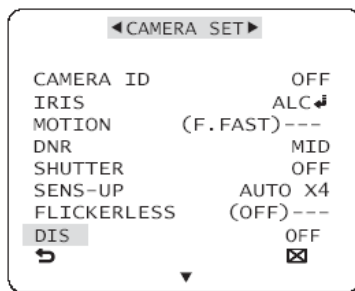
Configure the settings regarding the UART communication.
- ◆ **SYSTEM INFO.**

Display the system information including the camera version and communication settings.
- ◆ **LANGUAGE**

Select a preferred one from the supported languages.

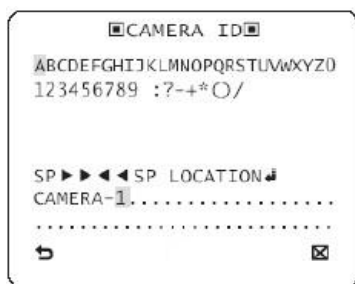


## 4-2-1.CAMERA SETUP



You can configure the general settings of the module. Select <MAIN MENU> → <CAMERA SET>. The Camera Setup menu appears. Change the settings as necessary, or select an item to check.

### ● CAMERA ID



The CAMERA ID menu is used for you to assign a unique name to a camera.

Use ▲▼▶◀\_ to select a desired character, then press [ENTER]. In the lower input box of the screen, the selected character will be entered.

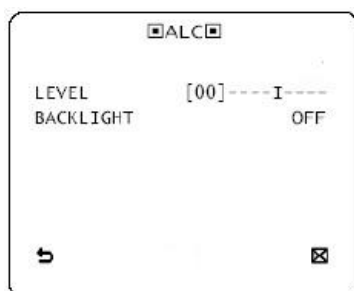
- You can enter up to 54 characters including alphabets, numbers and special characters.
- LOCATION : Specify the display position of the camera ID.

When done, press [ENTER]. The camera ID will be displayed in the specified position.

### ● IRIS

The **IRIS** menu is used if you want to adjust the intensity of radiation incoming to the camera.

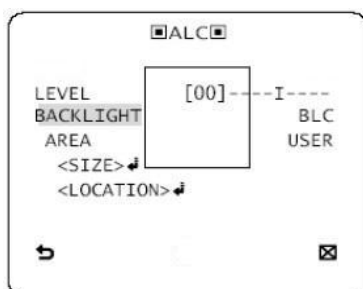
#### ◇ ALC (Automatic Light Control)



Adjust the open and close of the iris.

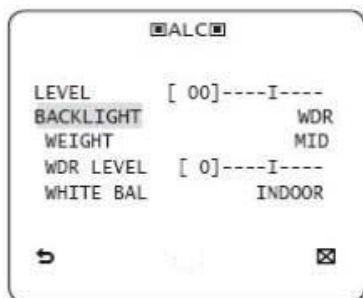
- LEVEL : Select an overall brightness level.

The LEVEL menu is used to adjust the overall brightness, where “+” will increase the brightness and “-” will decrease it.



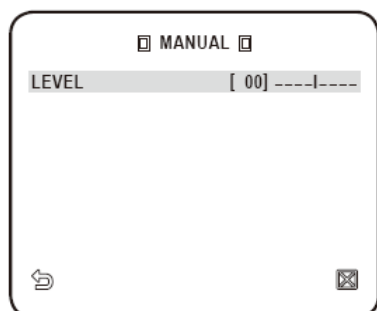
- BLC : With <BACKLIGHT> set to <BLC>, you can specify the BLC area. With AREA set to <USER>, you can specify the position and size.

If you use an ordinary camera in a scene with an intensive back light, the object will be displayed dark on the monitor affected by the back light. To solve this problem, you can use the **BLC**(Back Light Compensation) function to improve the sharpness of the image in such a high contrast scene.



- WDR : If you set <BACKLIGHT> to <WDR>, you will see a menu where you can set the WDR options. specify the shutter speed in WDR LEVEL, and the composition level in <WEIGHT>. Select OUTDOOR, or INDOOR in <WHITE BAL>. The WDR feature provides an extension of the gain range, which is useful, especially if you work on pictures both indoors and outdoors from inside of a building. Namely, it improves the sharpness of the picture in outdoor scenery as well as indoor.

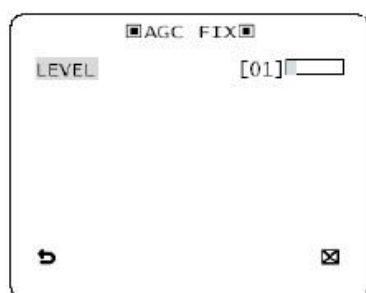
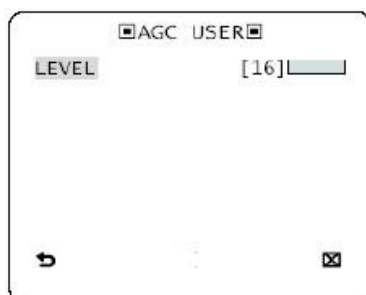
#### ◇ MANUAL



Adjust the iris level manually.

The overall brightness target of a camera will be set to ALC level 0, while the iris can be adjusted manually.

#### ● AGC(Auto Gain Control) / MOTION



With AGC active, if the signal strength falls below the standard level, AGC will amplify the video signal to automatically improve the sensitivity.

If <SENS-UP> is set to <OFF> or <FIX> mode, the <MOTION> menu will switch to <AGC>.

With the USER ( ) submenu selected, press [ENTER] to display the corresponding screen. In this mode, you can select from VERY LOW to VERY HIGH in 16 levels, enabling deeper, wider choices to your convenience. With the FIX ( ) submenu selected, press [ENTER] to display the corresponding screen. In this mode, you can select an individualized mode in 16 levels, regardless of the brightness.

- ※ As long as the DAY/NIGHT menu is set to AUTO in Camera Setup, the AGC menu is not available.
- ※ As long as FLICKERLESS is set to ON, the AGC mode is not available.
- ※ If you set BACKLIGHT to WDR, the AGC fix mode is not available.
- ※ If the DAY/NIGHT menu of the CAMERA SET is set to AUTO, the AGC menu will be deactivated.
- ※ If FLICKERLESS is set to ON, the AGC FIX mode will be disabled.

You can specify a level of AGC for controlling the camera motion. This is available only of the SENSE UP menu is set to AUTO. Select F.FAST if you want to monitor a very fast moving object in a low contrast scene, and S.SLOW if monitoring a very slow moving, inanimate object in the same condition.

- ※ As long as DAY/NIGHT is set to <AUTO>, the <MOTION> menu is not available.



● **DNR (Digital Noise Reduction)**

Reduces the noise on the screen. This is especially useful for a severely distorted screen. You can set the level if you set DNR to USER.

This module use the motion adaptive DNR algorithm. This is mixed 2D & 3D method data depends on motion.

● **SHUTTER**

The **SHUTTER** menu is used to set the fixed high-speed electronic shutter, auto high speed electronic shutter and external high speed electronic shutter(EXT).

You can select one of 7 options from 1/100(PAL:1/120) to 1/10K for the fixed high speed electronic shutter, which is mostly used for imaging a fast moving object.

※ As long as SENSE UP is set to AUTO, FIXED / FLICKERLESS to ON / BACKLIGHT to WDR, the SHUTTER menu is not available.

● **SENS-UP (Low Speed shutter)**

Automatically detects the ambient level of darkness in the dark or low contrast scene to extend the accumulated time, keeping the image bright and sharp; It can be also used as FIX mode.

※ If the SHUTTER menu is set to fixed electronic shutter mode, the SENSE UP menu will not be available.

If FLICKERLESS is set to ON, or BACKLIGHT to WDR, the FIX mode of the SENSE UP menu is not available.

● **FLICKERLESS**

If set to ON, the shutter speed will be fixed to 1/100(PAL:1/120) second. This will prevent possible screen distortion due to a mismatch between the vertical sync frequency and the blinking frequency of the lighting.

※ If SHUTTER is set to FIX, SENSE UP to FIX, and AGC to FIX, the <FLICKERLESS> menu is not available.

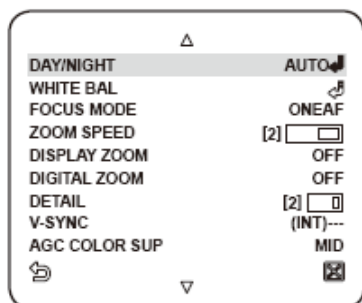
● **DIS (Digital Image Stabilization)**

Digital Image Stabilization will set the anti-shake compensation.

※ If you set DIS to ON, the compensation area will be enlarged as set in the digital zoom factor.

If you set the digital zoom factor to greater than the enlarged zoom factor for the compensation, the DIS function will be deactivated.

● **DAY/NIGHT**



◇ **DAY**

Fixed to DAY mode, regardless of the scene.

◇ **NIGHT**

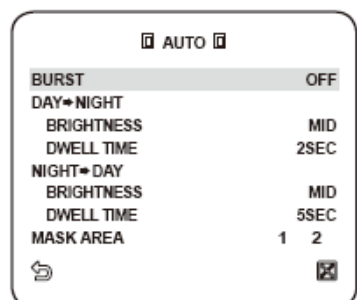
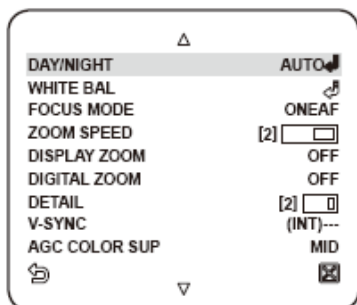
Fixed to NIGHT mode, regardless of the scene.

If BURST is set to <ON>, the burst signal will be output long with the black and white composite video signal.

◇ **AUTO**

According to the luminance, this will switch DAY to NIGHT mode, or vice versa.

※ If you use an infrared light source while in AUTO mode, this may cause a failure in AUTO SWITCH or AUTO FOCUS.

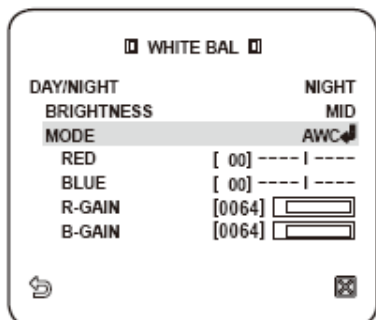
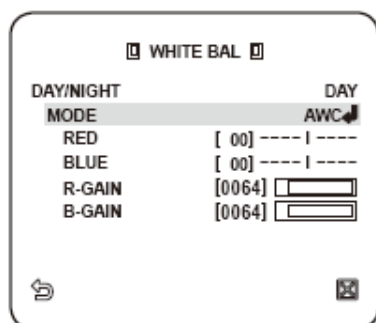


- BURST : If set to <OFF>, the burst signal will not be output in NIGHT mode.
- DAY→NIGHT BRIGHTNESS : Specify the brightness level switching from COLOR to BW filter. Adjusting from HIGH to LOW will cause to switch the filter in a darker screen.
- DAY→NIGHT DWELL TIME : Time required to determine the filter switch.
- NIGHT→DAY BRIGHTNESS : Specify the brightness level switching from BW to COLOR filter. Adjusting from HIGH to LOW will cause to switch the filter in a darker screen.
- NIGHT→DAY DWELL TIME : Time required to determine the filter switch.

- MASK AREA : If there exists a bright spot light source in a night scene, you can specify the size and position as needed. This will prevent an error in switching filter, or failure to determine the filter switch in a night scene where a bright spot light source exists. Any excessively bright area in a night scene will be masked.

- ※ You can specify MASK 1 and 2 simultaneously.
- ※ If <BACKLIGHT> is set to <BLC>, the MASK AREA function is not available.

## ● WHITE BAL



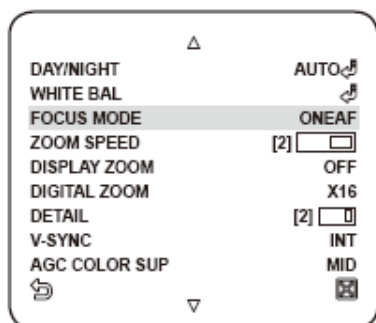
If you need to adjust the color according to the ambient illumination, you can use the <WHITE BAL> function.

- DAY : You can set the RED, and BLUE value in DAY mode. The screen will be displayed in colors according to your settings. You can set the R-GAIN, and B-GAIN value only in <AWC> mode.
- NIGHT : You can set the <WHITE BAL> according to the ambient illumination. If NIGHT mode is set to <OFF>, the <WHITE BAL> will operate in a mode specified in DAY mode at all times; otherwise, the screen will switch to a mode specified in <DAY/NIGHT>. You can set the RED, BLUE and BRIGHTNESS value in DAY mode. The screen will be displayed in colors according to your settings.

According to the specified recording mode, select a <WHITE BAL> mode with necessary options.

- ATW1,2 : The camera can automatically adjust the color temperature in real time, according to the ambient conditions.  
(Color temperature range ATW1: 2500K ~ 9500K, ATW2 : 2000K ~ 10000K)
- AWC : Pressing [ENTER] on a desired item will perform ATW once.  
※ You can set the R-GAIN/B-GAIN value.
- 3200K : Set the color temperature to 3200K.
- 5600K : Set the color temperature to 5600K.
- RED : Adjust the strength of the red color.
- BLUE : Adjust the strength of the blue color.
- R-GAIN/B-GAIN : Specify the current color temperature manually. (only in AWC state)
- BRIGHTNESS : Specify a brightness level switching from DAY mode to NIGHT mode set.

## ● FOCUS MODE



You can select a focus mode according to the angle that you adjusted for camera recording.

- AF : This will monitor the screen continuously to focus automatically. If you adjust the focus manually, that will operate the same as in <MF>. This will also restore focus after the operation of zoom.
- ONEAF : Restores focus after the operation of zoom, and operates the same as in <MF> unless the operation of zoom is executed.
- MF : You can adjust the focus manually.

※ While you are working on the following objects, <AF> may not work properly.  
If this is the case, use <MF> instead.

- Very bright object, or dominant object in a dark scene
- Object against the rear side of a moist or dirty glass
- A scene where nearby and distant objects co-exist
- White wall or single-colored object
- Venetian blinds and other horizontally striped objects

## ● ZOOM SPEED

You can adjust the zoom operation speed.  
The zoom speed is the fastest when the value is 4.

## ● DISPLAY ZOOM

You can set to display the zoom status on the screen.  
It will disappear in about 3 seconds if the zoom factor has no further change.

## ● DIGITAL ZOOM

You can set the maximum allowable digital zoom ratio.  
Digital Zoom will start operation after it is zoomed in to the maximum optical ratio of x39. If you set DIGITAL ZOOM to x12, you can take a shot at up to x468 (39x12).  
When you set DISPLAY ZOOM as on, you may see zoom value on the screen.

● **DETAIL**

Controls the horizontal or vertical distinction.

● **V-SYNC**

Select the vertical sync mode for INT or LINE.

If you select INT, the camera will use the internal synchronization.

If selecting LINE, the camera will use the external power source frequency for the synchronization. The LL-PHASE can be adjusted as appropriate.

※ No input the L-Pulse signal will fix V-SYNC to INT, which can not be changed.

● **AGC COLOR SUP (AGC Color Suppression)**

Adjust the color scheme according to **AGC** operation value.

● **REVERSE**

Mirrors video signals horizontally, vertically, or both.

● **POSI/NEGA : +, -**

Output as it is or mirror the video brightness signal.

● **PIP (Picture In Picture)**

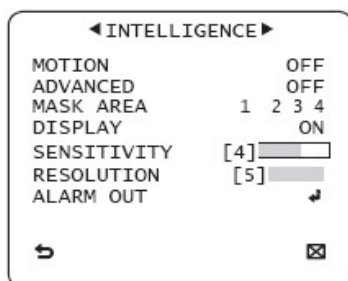
Displays a sub image together with the main image on the same screen using the Picture In Picture function.

※ If more than one PRIVACY ZONE is specified, and PRIVACY SET to <ON>, the PIP function is not available.

As long as SENSE UP is set to FIXED, PIP menu is not available.

According to the luminance, PIP will disappear if the SENSE UP menu is set to AUTO.

## 4-2-2. INTELLIGENCE SET UP



You can set the motion detection and tracking in the INTELLIGENCE menu.

※ In following situations, motion detection and tracking function may not work properly.

- When there is sudden changes of brightness
- When the device moves
- When a certain object's movement fills most of the framing area
- When there is difficulties in distinguishing the moving object and background.

● **MOTION**

- TRACKING : Detects and tracks a moving object.
- DETECTION : Detects a moving object.

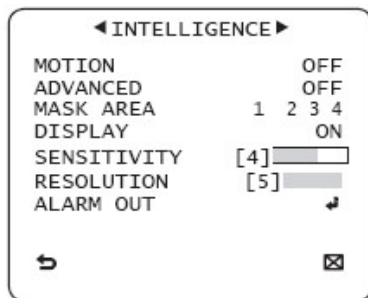
● **ADVANCED**

If an object on the screen suddenly disappears or an object comes out of nowhere and stays for a certain time, the area will be displayed.

※ In following situations, FIXED/MOVED detection may not work properly.

- When multiple motions continue arbitrarily.
- When the object that is fixed continues to move in the same position.
- When a newly appearing object conceals another object that is moving.

## ● MASK AREA



Select the number of the area to be masked that will be excluded from motion detection.  
Select the mask number and set the mask size and its coverage.

## ● DISPLAY : ON, OFF

With the DISPLAY option set to ON, a motion function will be displayed on the screen, if detected.

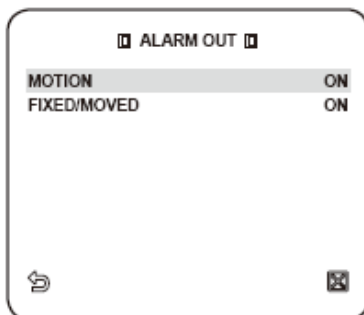
## ● SENSITIVITY : 1~7

Set the sensitivity of the motion detection.

## ● RESOLUTION : 1~5

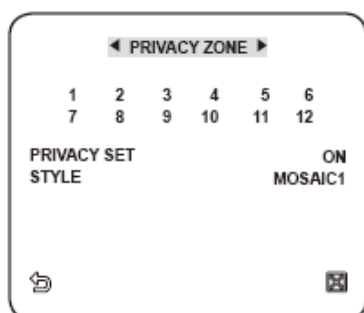
If setting it to high, the camera can detect even a trivial movement of the target.

## ● ALARM OUT

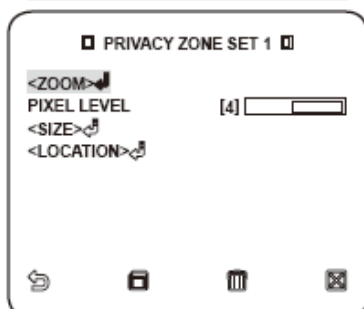


When selected <ON>, it outputs alarm signal when the motion is detected and on a detection of configured advanced function.

## 4-2-3. PRIVACY ZONE SETUP



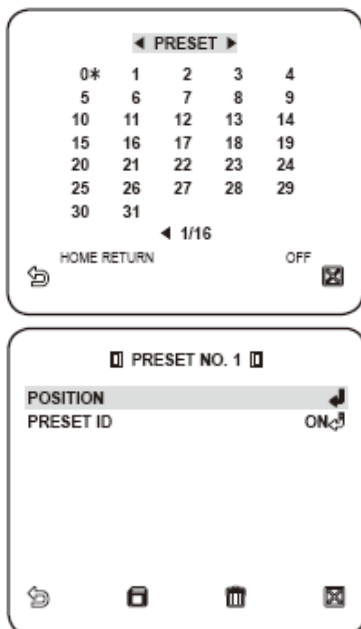
You can set up to 12 privacy zones that will be hidden for privacy of the subject when recording.



Select <MAIN MENU>-<PRIVACY ZONE>.  
Select the number of the zone and press [ENTER].  
The Zone setup screen appears.  
Select the <ZOOM> and press [ENTER].  
Using ▲▼\_+ to locate zoom position.  
Select the <PIXEL LEVEL>.  
Select the pixel level for the SIZE and LOCATION settings.  
Select the <SIZE> and press [ENTER].  
Using ▲▼\_+, set the size of the privacy zone.  
Select the <LOCATION> and press [ENTER].  
Using ▲▼\_+, set the position of the privacy zone.  
Save the changes and move to the previous screen and select the <STYLE>.  
Select the <COLOR> and pick a desired color.

- ※ Setting one or more privacy zone and enabling privacy function will disable the PIP function.  
For better privacy protection, make your privacy zone bigger than the required, bigger by about 30%.  
Video portion of mosaic pattern or colored by the privacy zone setup is not recoverable.

#### 4-2-4. PRESET SET



This function provides preset camera settings such as zoom and focus so to enable quicker and easier accessing and monitoring, which supports up to 212 presets.

Select <MAIN MENU>-<PRESET>.

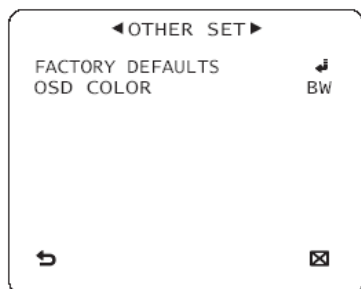
Select the preset number.

Select <POSITION>.

Set <PRESET ID> to <ON> and enter the name.

For entering the name, refer to "CAMERA ID".

#### 4-2-5. OTHER SET



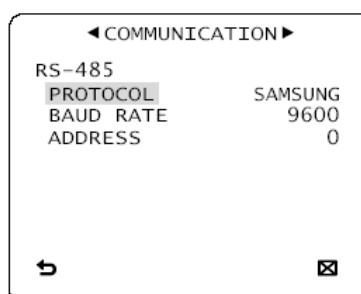
##### ● FACTORY DEFAULTS

All the settings will be restored to the factory default. However, the settings of PROTOCOL, BAUD RATE, ADDRESS and LANGUAGE will not be restored to the default.

##### ● OSD COLOR : BW, R/G/B

You can set the OSD(On-screen Display) color to COLOR or B/W.

#### 4-2-6. COMMUNICATION



The COMMUNICATION menu is used to configure the settings regarding UART communications. Use the connector of the camera to connect to UART. Use the ▲▼◀▶ switch to specify the protocol and baud rate for communications.

##### ● PROTOCOL

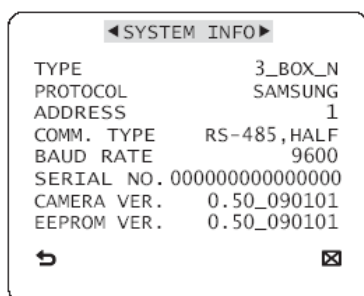
SAMSUNG, PELCO-P/D, VICON, PANASONIC, PHILIPS, ERNA, DIAMOND, VCLTP, KALATEL

##### ● BAUD RATE : 2400, 4800, 9600, 19200, 38400

※The baud rate differs, depending on the specified protocol.

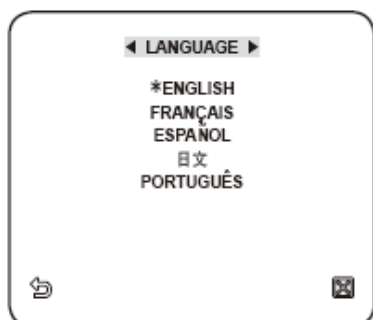
##### ● ADDRESS : 0~255

## 4-2-7. SYSTEM INFORMATION



You can view the system information including the protocol, address, baud rate, serial number, camera version, and EEPROM version.

## 4-2-8. LANGUAGE SET UP



The camera supports 5 different languages. Select a preferred language.

## 5. Communication

### 1) Connection

- ◆ Data Communication : Start-Stop Synchronized serial interface
- ◆ Data length : 8bit data
- ◆ Stop bit : 1 bit
- ◆ Parity : None
- ◆ Baudrate : 4800, 9600, 19200, 38400 bps ※default value : 9600 bps

### 2) Communication Protocol

- ◆ All communication data consist of nine bytes.
- ◆ Communication data start with A0(h).
- ◆ The format of the communication data is shown below.

9 Byte Fixed

| Byte1                        | Byte 2                       | Byte 3                       | Byte 4~8           | Byte 9                   |
|------------------------------|------------------------------|------------------------------|--------------------|--------------------------|
| <b>Start Code<br/>A0H(1)</b> | <b>Sender<br/>Address(1)</b> | <b>Target<br/>Address(1)</b> | <b>Command (5)</b> | <b>Check sum<br/>(1)</b> |

| Data Byte | Type           | Contents                                     | Remarks                    |
|-----------|----------------|--|----------------------------|
| Byte 1    | Start Code     | A0H  | Data Packet Starting Point |
| Byte 2    | Sender Address | Sender address                               |                            |
| Byte 3    | Target Address | Target address                               |                            |
| Byte 4    | Command        |  |                            |
| Byte 5    |                |  |                            |
| Byte 6    |                |  |                            |
| Byte 7    |                |  |                            |
| Byte 8    |                |  |                            |
| Byte 9    | Check Sum      | LSB* of (FFFFH - ( Sum from Byte2 to Byte8)) |                            |

※ Checksum calculating example

Example of Pan(Left) command with motor speed 20H.

In this example, camera's address is 01H.

| Byte 2 | Byte 3 | Byte 4 | Byte 5 | Byte 6 | Byte 7 | Byte 8 | Byte 9 |
|--------|--------|--------|--------|--------|--------|--------|--------|
| 00H    | 01H    | 01H    | 00H    | 01H    | 20H    | 00H    | DCH    |

Sum from Byte2 to Byte8 = 23H

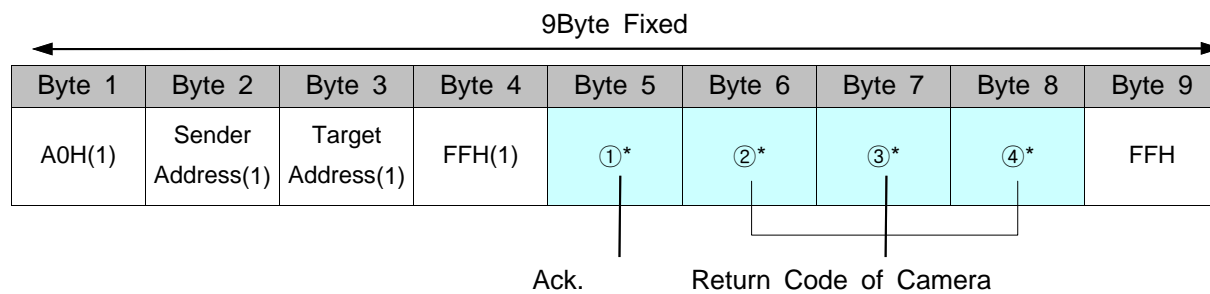
∴ FFFFH - 23H = FFDCH ; LSB of FFDCH=DCH

∴ Check Sum : DCH

#### ◆ Ack. Format

Samsung communication utilizes Ack. codes. When controller sends a command, the camera sends back an Ack. This is our basic procedure to make sure that the communication and the camera function are properly executed.





ACK is applicable only in case that Byte4 of the command is 03H.

Byte5, Byte6 and Byte7 of the Ack. data means as follows.

①\* Byte5 of the Ack. data indicates whether the camera received command successfully.

00H : OK

01H : Error (Request Re-transmission)

②\* Byte6 of the Ack. data indicates the mode in which camera is working.

| Camera Mode | Byte6 | Byte7      |
|-------------|-------|------------|
| Manual      | 00H   | 00H        |
| Menu        | 01H   | Don't care |

# ◆ Camera Control Command

| Command            |  |   |     | Byte4 | Byte5 | Byte6 | Byte7 | Byte8 | Items   |   |     |   |     |   |     |       |     |   | Ack |
|--------------------|--|---|-----|-------|-------|-------|-------|-------|---|---|-----|---|-----|---|-----|-------|-----|---|-----|
| COMMUNICA<br>TION  | PROTOCOL   |   |     | 02H   | 19H   | 03H   | 00H   | **H   | 00H: SAMSUNG      01H: VICON<br>02H: PANASONIC    03H: PHILIPS<br>04H: PELCO-P        05H: KALATEL<br>06H: ERNA            07H: DIAMOND<br>08H: VCLTP           09H: PELCO-D                        |   |     |   |     |   |     |       |     |   | O   |
|                    | BAUDRATE   |   |     | 02H   | 19H   | 00H   | 00H   | **H   | 00H: 4800 bps,    01H: 9600 bps<br>02H: 19200 bps, 03H: 38400 bps   |   |     |   |     |   |     |       |     |   | O   |
|                    | ADDRESS  |   |     | 02H   | 19H   | 01H   | 00H   | **H   | 00H~FFH: 0~255  |   |     |   |     |   |     |       |     |   | O   |
|                    | * When you change the protocol, maybe the baudrate and the address will be changed automatically because some protocol is not support some baudrate and address. |   |     |       |       |       |       |       |   |   |     |   |     |   |     |       |     |   |     |
| KEY(SWITCH)        | ENTER  |   |     | 03H   | 18H   | FFH   | 00H   | FFH   |   |   |     |   |     |   |     |       |     |   | O   |
|                    | UP   |   |     | 03H   | 03H   | FFH   | 00H   | FFH   |   |   |     |   |     |   |     |       |     |   | O   |
|                    | DOWN   |   |     | 03H   | 09H   | FFH   | 00H   | FFH   |   |   |     |   |     |   |     |       |     |   | O   |
|                    | LEFT   |   |     | 03H   | 05H   | FFH   | 00H   | FFH   |   |   |     |   |     |   |     |       |     |   | O   |
|                    | RIGHT  |   |     | 03H   | 07H   | FFH   | 00H   | FFH   |   |   |     |   |     |   |     |       |     |   | O   |
| SYSTEM             | RESET  |   |     | 02H   | 00H   | 00H   | 00H   | 00H   | Camera reboot   |   |     |   |     |   |     |       |     |   | O   |
|                    | FACTORY DEFAULT  |   |     | 02H   | 01H   | 00H   | 00H   | 00H   | Return to factory default setting   |   |     |   |     |   |     |       |     |   | O   |
|                    | REQUEST MODEL NAME   |   |     | FCH   | 00H   | 00H   | 00H   | FCH   | A0 FD 00 FC 00 00 00 FC 0A  |   |     |   |     |   |     |       |     |   | O   |
|                    | INFORMATION DISPLAY  |   |     | 02H   | 1CH   | 00H   | 00H   | **H   | 00H: OFF, 01H: ON   |   |     |   |     |   |     |       |     |   | O   |
| COMMAND            | OPERATION SAVE   |   |     | 02H   | 22H   | 00H   | 00H   | 00H   |   |   |     |   |     |   |     |       |     |   | O   |
|                    | OPERATION CANCEL   |   |     | 02H   | 23H   | 00H   | 00H   | 00H   |   |   |     |   |     |   |     |       |     |   | O   |
| OSD<br>(MAIN MENU) | ON   |   |     | 03H   | 17H   | 01H   | 00H   | FFH   |   |   |     |   |     |   |     |       |     |   | O   |
|                    | OFF  |   |     | 03H   | 17H   | 00H   | 00H   | FFH   |   |   |     |   |     |   |     |       |     |   | O   |
|                    | OSD COLOR  |   |     | 02H   | 1BH   | 00H   | 00H   | **H   | 00H: BW, 01H: R, 02H: G, 03H: B   |   |     |   |     |   |     |       |     |   | O   |
| CAMERA<br>ID       | CAMERA ID OPERATION  |   |     | 02H   | 0AH   | 00H   | 00H   | **H   | 00H: OFF, 01H: ON   |   |     |   |     |   |     |       |     |   | O   |
|                    | ID SET   |   |     | 02H   | 0AH   | 01H   | *1H   | *2H   | *1H (CAMERA ID Sequence)<br>01H~36H: 0 ~ 54<br>*2H (String) : note the below table  |   |     |   |     |   |     |       |     |   | O   |
|                    | *String Table  |   |     |       |       |       |       |       |   |   |     |   |     |   |     |       |     |   |     |
|                    | 00H  | A | 05H | F     | 0AH   | K     | 0FH   | P     | 14H   | U | 19H | Z | 1EH | 4 | 23H | 9     | 28H | + |     |
|                    | 01H  | B | 06H | G     | 0BH   | L     | 10H   | Q     | 15H   | V | 1AH | 0 | 1FH | 5 | 24H | space | 29H | * |     |
|                    | 02H  | C | 07H | H     | 0CH   | M     | 11H   | R     | 16H   | W | 1BH | 1 | 20H | 6 | 25H | :     | 2AH | ( |     |
|                    | 03H  | D | 08H | I     | 0DH   | N     | 12H   | S     | 17H   | X | 1CH | 2 | 21H | 7 | 26H | ?     | 2BH | ) |     |
|                    | 04H  | E | 09H | J     | 0EH   | O     | 13H   | T     | 18H   | Y | 1DH | 3 | 22H | 8 | 27H | -     | 2CH | / |     |
|                    |  |   |     |       |       |       |       |       |   |   |     |   |     |   |     |       |     |   |     |
|                    | ID LOCATION  |   |     | 02H   | 0AH   | 02H   | 00H   | **H   | 00H: UP      01H: DOWN<br>02H: LEFT    03H: RIGHT   |   |     |   |     |   |     |       |     |   | O   |
| IRIS               | ALC (Auto Iris)  |   |     | 02H   | 02H   | 00H   | 00H   | 00H   | Iris Auto   |   |     |   |     |   |     |       |     |   | O   |
|                    | ALC LEVEL  |   |     | 02H   | 02H   | 00H   | 02H   | **H   | 00H~40H: -32~+32  |   |     |   |     |   |     |       |     |   | O   |
|                    | BLC OFF  |   |     | 02H   | 02H   | 03H   | 00H   | 00H   | Back Light Compensation Off   |   |     |   |     |   |     |       |     |   | O   |
|                    | BLC ON   |   |     | 02H   | 02H   | 03H   | 00H   | 01H   | Back Light Compensation On  |   |     |   |     |   |     |       |     |   | O   |
|                    | BLC ON AREA set  |   |     | 02H   | 02H   | 04H   | 00H   | **H   | 00H: USER    01H: BOTTOM<br>02H: TOP      03H: LEFT<br>04H: RIGHT    05H: CENTER  |   |     |   |     |   |     |       |     |   | O   |
|                    | BLC ON AREA DISPLAY ON   |   |     | 02H   | 02H   | 06H   | 00H   | **H   | 00H: OFF    01H: ON   |   |     |   |     |   |     |       |     |   | O   |
|                    | BLC ON USER SIZE & LOCATION  |   |     | 02H   | 02H   | 04H   | *1H   | *2H   | *1H<br>01H: SIZE change<br>02H: LOCATION change<br>*2H<br>00H: height increase / move up<br>01H: height decrease / move down<br>02H: width decrease / move left<br>03H: width increase / move right |   |     |   |     |   |     |       |     |   | O   |

|  |   |     |     |     |     |      |  |           |     |          |   |
|--|---|-----|-----|-----|-----|------|--|-----------|-----|----------|---|
|  | BLC ON USER AREA<br>Horizontal Start Point  | 02H | 02H | 07H | *Hi | *Low | 0x00H ~ 0x277H   |           |     |          | O |
|  | BLC ON USER AREA<br>Horizontal End Point  | 02H | 02H | 08H | *Hi | *Low | 0x79H ~ 0x2B7H   |           |     |          | O |
|  | BLC ON USER AREA<br>Vertical Start Point  | 02H | 02H | 09H | *Hi | *Low | 0x00H ~ 0xIDIH   |           |     |          | O |
|  | BLC ON USER AREA<br>Vertical End Point  | 02H | 02H | 0AH | *Hi | *Low | 0x5DH ~ 0x211H   |           |     |          | O |
|  | * The BLC USER area minimum length is 121 (0x79) ; minimum width is 94 (0x5D).<br>If you set the area is smaller than the minimum area, it only can display the minimum area.                                   |     |     |     |     |      |  |           |     |          |   |
|  | WDR ON  | 02H | 02H | 03H | 00H | 02H  |  |           |     |          | O |
|  | * This function can't be enabled at IRIS manual.  |     |     |     |     |      |  |           |     |          |   |
|  | WDR WEIGHT  | 02H | 02H | 05H | 02H | **H  | 00H: LOW, 01H: MID, 02H: HIGH  |           |     |          | O |
|  | WDR LEVEL   | 02H | 02H | 05H | 03H | **H  | 00H~12H: -9~+9   |           |     |          | O |
|  | WDR WHITE BAL   | 02H | 02H | 05H | 01H | **H  | 00H: INDOOR, 01H: OUTDOOR  |           |     |          | O |
|  | MANUAL IRIS   | 02H | 02H | 01H | 00H | 00H  | Iris Manual  |           |     |          | O |
|  | MANUAL LEVEL  | 02H | 02H | 01H | 01H | **H  | 00H~40H: -32~+32   |           |     |          | O |
|  | IRIS OPEN   | 01H | 08H | 00H | 00H | 00H  |  |           |     |          | X |
|  | IRIS CLOSE  | 01H | 10H | 00H | 00H | 00H  |  |           |     |          | X |
|  | IRIS STOP   | 01H | 00H | 00H | 00H | 00H  |  |           |     |          | X |
| AGC or<br>MOTION   | AGC LEVEL (MAX.)  | 02H | 05H | 00H | 00H | **H  | 00H: OFF, 01H: VERY LOW<br>02H: LOW, 03H: MID<br>04H: HIGH, 05H: VERY HIGH<br>06H: USER, 07H: FIX            |           |     |          | O |
|  | AGC USER LEVEL  | 02H | 05H | 00H | 01H | **H  | 01H~10H: 1~16  |           |     |          | O |
|  | AGC FIX LEVEL   | 02H | 05H | 00H | 02H | **H  | 01H~10H: 1~16  |           |     |          | O |
|  | MOTION  | 02H | 05H | 01H | 00H | **H  | 00H: S.SLOW, 01H: SLOW,<br>02H: NORM, 03H: FAST<br>04H: F.FAST   |           |     |          | O |
|  | *When SENS UP is OFF/FIX, AGC can be used and when SENS UP is AUTO, MOTION can be used.<br>*AGC/MOTION function is disabled when COLOR/BW mode is AUTO.<br>*This function cannot be used at WDR ON and AGC FIX, |     |     |     |     |      |  |           |     |          |   |
| DNR  | DNR   | 02H | 0BH | 00H | 00H | **H  | 00H: OFF, 01H: LOW, 02H: MID<br>03H: HIGH, 04H: USER   |           |     |          | O |
|  | DNR USER LEVEL  | 02H | 0BH | 01H | 00H | **H  | 01H~10H: 1~16  |           |     |          | O |
| SHUTTER  | OFF ~ ON  | 02H | 04H | 00H | 00H | **H  | 00H: OFF, 01H: 1/100(1/120),<br>02H: 1/250, 03H: 1/500, 04H: 1/1000,<br>05H: 1/2000, 06H: 1/4000, 07H: 1/10K |           |     |          | O |
|  | *This function is disabled when FLICKERLESS is ON or SENS-UP is not OFF or WDR is ON.   |     |     |     |     |      |  |           |     |          |   |
| SENS-UP  | OFF ~ AUTO X256<br>~ FIX X256   | 02H | 03H | 00H | 00H | **H  |  |           |     |          | O |
|  |   |     |     |     |     |      | 00H  | OFF       | 10H | FIX X4   |   |
|  |   |     |     |     |     |      | 01H  | AUTO X2   | 11H | FIX X6   |   |
|  |   |     |     |     |     |      | 02H  | AUTO X4   | 12H | FIX X8   |   |
|  |   |     |     |     |     |      | 03H  | AUTO X6   | 13H | FIX X12  |   |
|  |   |     |     |     |     |      | 04H  | AUTO X8   | 14H | FIX X16  |   |
|  |   |     |     |     |     |      | 05H  | AUTO X12  | 15H | FIX X24  |   |
|  |   |     |     |     |     |      | 06H  | AUTO X16  | 16H | FIX X32  |   |
|  |   |     |     |     |     |      | 07H  | AUTO X24  | 17H | FIX X48  |   |
|  |   |     |     |     |     |      | 08H  | AUTO X32  | 18H | FIX X64  |   |
|  |   |     |     |     |     |      | 09H  | AUTO X48  | 19H | FIX X96  |   |
|  |   |     |     |     |     |      | 0AH  | AUTO X64  | 1AH | FIX X128 |   |
|  |   |     |     |     |     |      | 0BH  | AUTO X96  | 1BH | FIX X256 |   |
|  |   |     |     |     |     |      | 0CH  | AUTO X128 | 1CH |          |   |
|  |   |     |     |     |     |      | 0DH  | AUTO X256 | 1DH | -        |   |
|  |   |     |     |     |     |      | 0EH  |           | 1EH | -        |   |
|  |   |     |     |     |     |      | 0FH  | FIX X2    | 1FH | -        |   |
| *This function is disabled when SHUTTER is not OFF                                       |   |     |     |     |     |      |  |           |     |          |   |
| *SENS-UP FIX mode is disabled when WDR is ON, or SHUTTER is not OFF or FLICKERLESS is ON |   |     |     |     |     |      |  |           |     |          |   |

|              |  |     |     |     |     |      |   |   |
|--------------|--|-----|-----|-----|-----|------|---|---|
| FLICKER-LESS | FLICKERLESS  | 02H | 0CH | 00H | 00H | **H  | 00H:OFF, 01H:ON   | O |
|              | *This function is disabled when SHUTTER is FIX or SENS-UP is FIX or AGC is FIX.            |     |     |     |     |      |   |   |
| DIS          | DIS  | 02H | 15H | 00H | 00H | **H  | 00H:OFF, 01H:ON   | O |
|              | *When zoom ratio is more than 45x including DZOOM, DIS function becomes automatically OFF. |     |     |     |     |      |   |   |
| DAY/NIGHT    | DISPLAY  | 02H | 06H | 00H | 00H | **H  | 00H: DAY, 01H: NIGHT<br>02H: AUTO   | O |
|              | BURST  | 02H | 06H | 01H | 00H | **H  | 00H:OFF, 01H:ON   | O |
|              | DAY/NIGHT AUTO<br>DAY → NIGHT<br>BRIGHTNESS  | 02H | 06H | 02H | 00H | **H  | 00H:LOW, 01H:MID, 02H:HIGH  | O |
|              | DAY/NIGHT AUTO<br>DAY → NIGHT<br>DWELL TIME  | 02H | 06H | 02H | 01H | **H  | 00H: 2sec, 01H: 3sec, 02H: 5sec<br>03H: 10sec, 04H: 15sec, 05H: 20sec<br>06H: 25sec, 07H: 30sec   | O |
|              | DAY/NIGHT AUTO<br>NIGHT → DAY<br>BRIGHTNESS  | 02H | 06H | 02H | 02H | **H  | 00H: LOW, 01H: MID, 02H: HIGH   | O |
|              | DAY/NIGHT AUTO<br>NIGHT → DAY<br>DWELL TIME  | 02H | 06H | 02H | 03H | **H  | 00H: 2sec, 01H: 3sec, 02H: 5sec<br>03H: 10sec, 04H: 15sec, 05H: 20sec<br>06H: 25sec, 07H: 30sec   | O |
|              | DAY/NIGHT AUTO<br>MASK AREA<br>OPERATION   | 02H | 06H | 03H | *1H | *2H  | **1H<br>00H: AREA1, 01H: AREA2<br>*2H<br>00H: OFF, 01H: ON  | O |
|              | DAY/NIGHT AUTO<br>MASK AREA<br>MENU DISPLAY  | 02H | 06H | 06H | *1H | *2H  | **1H<br>00H: AREA1, 01H: AREA2<br>*2H<br>00H: OFF, 01H: ON  | O |
|              | DAY/NIGHT AUTO<br>MASK AREA NO. 2<br>SIZE & LOCATION                                       | 02H | 06H | 04H | *1H | *2H  | *1H<br>01H: SIZE change<br>02H: LOCATION change<br>*2H<br>00H: height increase / move up<br>01H: height decrease / move Down<br>02H: width decrease / move left<br>03H: width increase / move right | O |
|              | DAY/NIGHT AUTO<br>MASK AREA NO. 1<br>SIZE & LOCATION                                       | 02H | 06H | 05H | *1H | *2H  | *1H<br>01H: SIZE change<br>02H: LOCATION change<br>*2H<br>00H: height increase / move up<br>01H: height decrease / move Down<br>02H: width decrease / move left<br>03H: width increase / move right | O |
|              | MASK AREA 1<br>Horizontal Start Point  | 02H | 06H | 07H | *Hi | *Low | 0x00H ~ 0x278H  | O |
|              | MASK AREA 1<br>Horizontal End Point  | 02H | 06H | 08H | *Hi | *Low | 0x78H ~ 0x2B7H  | O |
|              | MASK AREA 1<br>Vertical Start Point  | 02H | 06H | 09H | *Hi | *Low | 0x00H ~ 0x1D1H  | O |
|              | MASK AREA 1<br>Vertical End Point  | 02H | 06H | 0AH | *Hi | *Low | 0x5DH ~ 0x211H  | O |
|              | MASK AREA 2<br>Horizontal Start Point  | 02H | 06H | 17H | *Hi | *Low | 0x00H ~ 0x278H  | O |
|              | MASK AREA 2<br>Horizontal End Point  | 02H | 06H | 18H | *Hi | *Low | 0x78H ~ 0x2B7H  | O |
|              | MASK AREA 2<br>Vertical Start Point  | 02H | 06H | 19H | *Hi | *Low | 0x00H ~ 0x1D1H  | O |
|              | MASK AREA 2<br>Vertical End Point  | 02H | 06H | 1AH | *Hi | *Low | 0x5DH ~ 0x211H  | O |

|                  |   |     |     |     |      |       |  |   |
|------------------|---|-----|-----|-----|------|-------|--|---|
|                  | <p>* When BACKLIGHT is BLC, the MASK AREA is disable</p> <p>* The Mask area only can be used in AUTO mode</p> <p>* The area maximum length is 239 ( 0xEF ) ; maximum width is 188 (0xBC)</p> <p>If you set the area is larger than the maximum area, it only can display the maximum area</p> <p>* The area minimum length is 120 (0x78) ; minimum width is 94 (0x5D)</p> <p>If you set the area is smaller than the minimum area, it only can display the minimum area</p> |     |     |     |      |       |  |   |
| WHITE<br>BALANCE | DAY/NIGHT state select  | 02H | 07H | 10H | 00H  | **H   | 00H: Day<br>01H: Night   | O |
|                  | DAY MODE  | 02H | 07H | 00H | 00H  | **H   | 00H: ATW1, 01H: ATW2, 02H: AWC<br>03H: 3200K, 04H: 5600K   | O |
|                  | DAY RED   | 02H | 07H | 01H | 00H  | **H   | 00H~40H: -32~+32   | O |
|                  | DAY BLUE  | 02H | 07H | 01H | 01H  | **H   | 00H~40H: -32~+32   | O |
|                  | DAY AWC R-GAIN  | 02H | 07H | 02H | **Hi | **Low | 000H~3FFH: 0~1023  | O |
|                  | DAY AWC B-GAIN  | 02H | 07H | 03H | **Hi | **Low | 000H~3FFH: 0~1023  | O |
|                  | DAY AWC shot  | 02H | 07H | 04H | 00H  | 01H   |  | O |
|                  | NIGHT MODE  | 02H | 07H | 05H | 00H  | **H   | 00H: ATW1, 01H: ATW2, 02H: AWC<br>03H: 3200K, 04H: 5600K, 05H: OFF   | O |
|                  | NIGHT BRIGHTNESS  | 02H | 07H | 0AH | 00H  | **H   | 00H: LOW, 01H: MID, 02H: HIGH  | O |
|                  | NIGHT RED   | 02H | 07H | 06H | 00H  | **H   | 00H~40H: -32~+32   | O |
|                  | NIGHT BLUE  | 02H | 07H | 06H | 01H  | **H   | 00H~40H: -32~+32   | O |
|                  | NIGHT AWC R-GAIN  | 02H | 07H | 07H | **Hi | **Low | 000H~3FFH: 0~1023  | O |
|                  | NIGHT AWC B-GAIN  | 02H | 07H | 08H | **Hi | **Low | 000H~3FFH: 0~1023  | O |
|                  | NIGHT AWC shot  | 02H | 07H | 09H | 00H  | 01H   |  | O |
|                  | <p>* When AGC is OFF or FIX cannot select NIGHT mode</p> <p>* After sending the DAY/NIGHT state selection command, the screen of camera changes according to the selected state that do not change according to the current state.</p> <p>When sending the save command, the screen changes depending on the current state.</p>   |     |     |     |      |       |  |   |
| FOCUS            | FOCUS   | 02H | 08H | 00H | 00H  | **H   | 00H:ONEAF, 01H:AF, 02H:MF  | O |
|                  | FOCUS LIMIT   | 02H | 08H | 01H | 00H  | **H   | 00H: 5 cm, 01H: 20 cm  | O |
|                  | FOCUS FAR   | 01H | 01H | 00H | 00H  | 00H   | FOCUS FAR  | X |
|                  | FOCUS NEAR  | 01H | 02H | 00H | 00H  | 00H   | FOCUS NEAR   | X |
|                  | FOCUS STOP  | 01H | 03H | 00H | 00H  | 00H   | FOCUS STOP   | O |
|                  | FOCUS DIRECT  | 80H | 00H | 00H | **Hi | **Low | 0x7526 ~ 0x8900  | X |
|                  | * FOCUS STOP command must be used after sending FOCUS NEAR and FOCUS FAR command.   |     |     |     |      |       |  |   |
| ZOOM             | ZOOM SPEED  | 02H | 1DH | 00H | 00H  | **H   | 0H~03H: 1~4  | O |
|                  | ZOOM TELE   | 01H | 20H | 00H | 00H  | 00H   | ZOOM TELE  | X |
|                  | ZOOM WIDE   | 01H | 40H | 00H | 00H  | 00H   | ZOOM WIDE  | X |
|                  | ZOOM STOP   | 01H | 30H | 00H | 00H  | 00H   | ZOOM STOP  | O |
|                  | ZOOM DIRECT   | 10H | 00  | 00  | **Hi | **Low | Value : 0x80E6 ~ 0x9B00  | X |
|                  | ZOOM RATIO DISPLAY  | 02H | 1DH | 01H | 00H  | **H   | 00H: OFF, 01H: ON  | O |
|                  | * ZOOM STOP command must be used after sending ZOOM WIDE and ZOOM TELE command.   |     |     |     |      |       |  |   |
| DIGITAL<br>ZOOM  | DIGITAL ZOOM RATIO (MAX.)   | 02H | 0EH | 01H | 00H  | **H   | DZOOMDATA_OFF(x1) 00H<br>DZOOMDATA_x2 01H<br>DZOOMDATA_x3 02H<br>DZOOMDATA_x4 03H<br>DZOOMDATA_x5 04H<br>DZOOMDATA_x6 05H<br>DZOOMDATA_x7 06H<br>DZOOMDATA_x8 07H<br>DZOOMDATA_x9 08H<br>DZOOMDATA_x10 09H<br>DZOOMDATA_x11 0AH<br>DZOOMDATA_x12 0BH | O |
|                  | DIGITAL ZOOM DIRECT   | 64H | 00H | 00H | 00H  | *H    | DZOOM value 0x00H ~ 0xEBH  | X |
|                  | <p>* This function is disabled when D-ZOOM OFF.</p> <p>This value is depending on the D-ZOOM ratio, D-ZOOM ratio of the max DZOOM value is different.</p> <p>* If DZOOM DIRECT command can be sent, the zoom operates optical zoom max. value automatically and operates to the DZOOM.</p>  |     |     |     |      |       |  |   |

|                   |  |     |     |     |      |       |   |   |
|-------------------|--|-----|-----|-----|------|-------|---|---|
| DETAIL            | DETAIL   | 02H | 0FH | 00H | 00H  | **H   | 00H~03H: 0~3  | O |
| V-SYNC            | V-SYNC   | 02H | 10H | 00H | 00H  | **H   | 00H: INT, 01H: LINE LOCK  | O |
|                   | V-SYNC PHASE   | 02H | 10H | 01H | **Hi | **Low | NTSC 000H~20CH: -262~+262<br>PAL 000H~270H: -312~+312   | O |
|                   | * When power is DC, LINE LOCK is disabled automatically.   |     |     |     |      |       |   |   |
| AGC COLOR         | AGC COLOR SUPPRESSION  | 02H | 11H | 00H | 00H  | **H   | 00H:LOW, 01H:MID, 02H:HIG   | O |
| REVERSE           | REVERSE  | 02H | 12H | 00H | 00H  | **H   | 00H: OFF, 01H: H, 02H V, 03H: H/V   | O |
| POSI/NEGA         | POSI/NEGA  | 02H | 13H | 00H | 00H  | **H   | 00H:POSI, 01H:NEGA  | O |
| PIP               | PIP  | 02H | 14H | 00H | 00H  | **H   | 00H:OFF, 01H:ON   | O |
|                   | * This function is disabled when privacy zone is ON, and this PIP disappears when SENS-UP is operated. |     |     |     |      |       |   |   |
| IMAGE STILL       | IMAGE STILL  | 02H | 26H | 01H | 00H  | **H   | 00H: OFF, 01H: ON   | O |
| LENS              | INITIALIZATION   | 02H | 24H | 00H | 00H  | 00H   |   | O |
| INTELLI-<br>GENCE | MOTION DETECTION   | 02H | 16H | 00H | 00H  | **H   | 00H: OFF, 01H: TRACKING,<br>02H: DETECTION  | O |
|                   | MOTION ADVANCED  | 02H | 16H | 01H | 00H  | **H   | 00H:OFF, 01H:FIXED/MOVED  | O |
|                   | MOTION DISPLAY ON  | 02H | 16H | 03H | 00H  | **H   | 00H:OFF, 01H:ON   | O |
|                   | MOTION SENSITIVITY   | 02H | 16H | 04H | 00H  | **H   | 00H~06H: 1~7  | O |
|                   | RESOLUTION   | 02H | 16H | 05H | 00H  | **H   | 00H~04H: 1~5  | O |
|                   | ALARM OUT  | 02H | 16H | 06H | *1H  | *2H   | *1<br>00H: MOTION DETECTION<br>01H: FIXED/MOVED<br>*2<br>00H:OFF, 01H:ON  | O |
|                   | MOTION MASK AREA OPERATION   | 02H | 16H | 02H | *1H  | *2H   | *1<br>00H~03H: MASK AREA1~4<br>*2<br>00H: OFF, 01H: ON  | O |
|                   | MOTION MASK AREA MENU (All) DISPLAY  | 02H | 16H | 0AH | 00H  | *H    | *H: 00H: OFF, 01H: ON   | O |
|                   | MOTION MASK AREA MENU Select   | 02H | 16H | 09H | *1H  | *2H   | *1<br>00H~03H: MASK AREA1~4<br>*2<br>00H: OFF, 01H: ON  | O |
|                   | MOTION MASK AREA SIZE  | 02H | 16H | 07H | *1H  | *2H   | *1 MASK AREA NO<br>00H ~ 03H : MASK NO.1~4<br>*2: SIZE adjust<br>00H: height increase<br>01H: height decrease<br>02H: width decrease<br>03H: width increase | O |
|                   | MOTION MASK AREA LOCATION  | 02H | 16H | 08H | *1H  | *2H   | *1 MASK AREA NO<br>00H ~ 03H: MASK NO.1~4<br>*2 LOCATION adjust<br>00H: UP move 01H: DOWN move<br>02H: LEFT move 03H: RIGHT move                            | O |
|                   | *MOTION ADVANCED is disabled when MOTION DETECTION is DETECTION.                                       |     |     |     |      |       |   |   |
| PRIVACY MASK      | PRIVACY SET  | 02H | 17H | 00H | 00H  | **H   | 00H: OFF, 01H:ON  | O |
|                   | STYLE  | 02H | 17H | 02H | 00H  | **H   | 00H~03H: MOSAIC1~4, 04H: COLOR  | O |
|                   | STYLE COLOR Y-LEVEL  | 02H | 17H | 02H | 01H  | **H   | 00H~DBH: 0~219  | O |
|                   | STYLE COLOR RED  | 02H | 17H | 02H | 02H  | **H   | 00H~E0H: 0~224  | O |
|                   | STYLE COLOR BLUE   | 02H | 17H | 02H | 03H  | **H   | 00H~E0H: 0~224  | O |
|                   | PIXEL LEVEL  | 02H | 17H | 05H | 00H  | **H   | 00H~07H: 1~8  | O |
|                   | PRIVACY MASK AREA MENU DISPLAY   | 02H | 17H | 01H | *1H  | *2H   | *1: 00H~0BH(1~12)<br>*2: 00H:OFF, 01H:ON  | O |

|   | PRIVACY MASK AREA SIZE     | 02H | 17H | 03H | *1H | *2H   | *1 MASK AREA NO<br>00H ~ 0BH: Mask NO.1~12<br>*2: SIZE adjust<br>00H: height increase<br>01H: height decrease<br>02H: width increase<br>03H: width decrease  | O                             |                               |   |   |   |   |   |        |        |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |         |         |  |  |  |  |  |  |                               |                               |  |  |  |  |  |  |   |   |
|---|----------------------------|-----|-----|-----|-----|---|--|-------------------------------|-------------------------------|---|---|---|---|---|--------|--------|--|--|--|--|--|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---------|---------|--|--|--|--|--|--|-------------------------------|-------------------------------|--|--|--|--|--|--|---|---|
|   | PRIVACY MASK AREA LOCATION | 02H | 17H | 04H | *1H | *2H   | *1 MASK AREA NO<br>00H ~ 0BH: MASK NO.1~12<br>*2 LOCATION adjust<br>00H: UP move    01H: DOWN move<br>02H: LEFT move   03H: RIGHT move   | O                             |                               |   |   |   |   |   |        |        |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |         |         |  |  |  |  |  |  |                               |                               |  |  |  |  |  |  |   |   |
|   | Horizontal Point 1         | 02H | 17H | 07H | *1H | *2H   | <table border="1"><thead><tr><th colspan="8">Byte 7</th><th colspan="8">Byte 8</th></tr></thead><tbody><tr><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td colspan="8">Pri NO.</td><td colspan="8">*Hi                      *Low</td></tr></tbody></table><br>Pri NO.: 0x0H ~ 0xBH<br>Horizontal point value : *Hi ~ *Low<br>0x00h ~ 0x2E8H | Byte 7                        |                               |   |   |   |   |   |        | Byte 8 |  |  |  |  |  |  |   | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0       | Pri NO. |  |  |  |  |  |  |                               | *Hi                      *Low |  |  |  |  |  |  |   | O |
|   | Byte 7                     |     |     |     |     |   |  |                               | Byte 8                        |   |   |   |   |   |        |        |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |         |         |  |  |  |  |  |  |                               |                               |  |  |  |  |  |  |   |   |
|   | 7                          | 6   | 5   | 4   | 3   | 2   | 1  | 0                             | 7                             | 6 | 5 | 4 | 3 | 2 | 1      | 0      |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |         |         |  |  |  |  |  |  |                               |                               |  |  |  |  |  |  |   |   |
|   | Pri NO.                    |     |     |     |     |   |  |                               | *Hi                      *Low |   |   |   |   |   |        |        |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |         |         |  |  |  |  |  |  |                               |                               |  |  |  |  |  |  |   |   |
|   | Horizontal Point 2         | 02H | 17H | 08H | *1H | *2H   | <table border="1"><thead><tr><th colspan="8">Byte 7</th><th colspan="8">Byte 8</th></tr></thead><tbody><tr><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td colspan="8">Pri NO.</td><td colspan="8">*Hi                      *Low</td></tr></tbody></table><br>Pri NO.: 0x0H ~ 0xBH<br>Horizontal point value : *Hi ~ *Low<br>0x00h ~ 0x2E8H | Byte 7                        |                               |   |   |   |   |   |        | Byte 8 |  |  |  |  |  |  |   | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0       | Pri NO. |  |  |  |  |  |  |                               | *Hi                      *Low |  |  |  |  |  |  |   | O |
| Byte 7  |                            |     |     |     |     |   |  | Byte 8                        |                               |   |   |   |   |   |        |        |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |         |         |  |  |  |  |  |  |                               |                               |  |  |  |  |  |  |   |   |
| 7   | 6                          | 5   | 4   | 3   | 2   | 1   | 0  | 7                             | 6                             | 5 | 4 | 3 | 2 | 1 | 0      |        |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |         |         |  |  |  |  |  |  |                               |                               |  |  |  |  |  |  |   |   |
| Pri NO.   |                            |     |     |     |     |   |  | *Hi                      *Low |                               |   |   |   |   |   |        |        |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |         |         |  |  |  |  |  |  |                               |                               |  |  |  |  |  |  |   |   |
| Vertical Point 1  | 02H                        | 17H | 09H | *1H | *2H | <table border="1"><thead><tr><th colspan="8">Byte 7</th><th colspan="8">Byte 8</th></tr></thead><tbody><tr><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td colspan="8">Pri NO.</td><td colspan="8">*Hi                      *Low</td></tr></tbody></table><br>Pri NO.: 0x0H ~ 0xBH<br>Vertical point value: *Hi ~ *Low<br>0x00h ~ 0x124H | Byte 7   |                               |                               |   |   |   |   |   | Byte 8 |        |  |  |  |  |  |  | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Pri NO. |         |  |  |  |  |  |  | *Hi                      *Low |                               |  |  |  |  |  |  | O |   |
| Byte 7  |                            |     |     |     |     |   |  | Byte 8                        |                               |   |   |   |   |   |        |        |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |         |         |  |  |  |  |  |  |                               |                               |  |  |  |  |  |  |   |   |
| 7   | 6                          | 5   | 4   | 3   | 2   | 1   | 0  | 7                             | 6                             | 5 | 4 | 3 | 2 | 1 | 0      |        |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |         |         |  |  |  |  |  |  |                               |                               |  |  |  |  |  |  |   |   |
| Pri NO.   |                            |     |     |     |     |   |  | *Hi                      *Low |                               |   |   |   |   |   |        |        |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |         |         |  |  |  |  |  |  |                               |                               |  |  |  |  |  |  |   |   |
| Vertical Point 2  | 02H                        | 17H | 0AH | *1H | *2H | <table border="1"><thead><tr><th colspan="8">Byte 7</th><th colspan="8">Byte 8</th></tr></thead><tbody><tr><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td colspan="8">Pri NO.</td><td colspan="8">*Hi                      *Low</td></tr></tbody></table><br>Pri NO.: 0x0H ~ 0xBH<br>Vertical point value: *Hi ~ *Low<br>0x00h ~ 0x124H | Byte 7   |                               |                               |   |   |   |   |   | Byte 8 |        |  |  |  |  |  |  | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Pri NO. |         |  |  |  |  |  |  | *Hi                      *Low |                               |  |  |  |  |  |  | O |   |
| Byte 7  |                            |     |     |     |     |   |  | Byte 8                        |                               |   |   |   |   |   |        |        |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |         |         |  |  |  |  |  |  |                               |                               |  |  |  |  |  |  |   |   |
| 7   | 6                          | 5   | 4   | 3   | 2   | 1   | 0  | 7                             | 6                             | 5 | 4 | 3 | 2 | 1 | 0      |        |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |         |         |  |  |  |  |  |  |                               |                               |  |  |  |  |  |  |   |   |
| Pri NO.   |                            |     |     |     |     |   |  | *Hi                      *Low |                               |   |   |   |   |   |        |        |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |         |         |  |  |  |  |  |  |                               |                               |  |  |  |  |  |  |   |   |
| PRIVACY MASK AREA SAVED DATA DELETE   | 02H                        | 17H | 06H | 00H | *H  | PRIVACY MASK No. : 0x0H ~ 0xBH  |  | O                             |                               |   |   |   |   |   |        |        |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |         |         |  |  |  |  |  |  |                               |                               |  |  |  |  |  |  |   |   |
| * REVERSE<br>OFF : the left bottom corner (0,0)    H : the right bottom corner (0,0)<br>V : the left top corner (0,0)        H/V : the right top corner (0,0)<br>* Using the PRIVACY MASK AREA SAVED DATA DELETE command, the Privacy point will be direct deleted even though not used the save command. |                            |     |     |     |     |   |  |                               |                               |   |   |   |   |   |        |        |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |         |         |  |  |  |  |  |  |                               |                               |  |  |  |  |  |  |   |   |
| PRESET  | PRESET SAVE                | 03H | 50H | **H | FFH | FFH   | **(PRESET No.)   |                               | O                             |   |   |   |   |   |        |        |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |         |         |  |  |  |  |  |  |                               |                               |  |  |  |  |  |  |   |   |
|   | PRESET MOVE                | 03H | 19H | **H | FFH | FFH   | **(PRESET No.)   |                               | O                             |   |   |   |   |   |        |        |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |         |         |  |  |  |  |  |  |                               |                               |  |  |  |  |  |  |   |   |
|   | PRESET DELETE              | 03H | 51H | **H | FFH | FFH   | **(PRESET No.)   |                               | O                             |   |   |   |   |   |        |        |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |         |         |  |  |  |  |  |  |                               |                               |  |  |  |  |  |  |   |   |
|   | HOME RETURN                | 02H | 21H | 00H | 00H | **H   | 00H~47H: OFF,1~60 min., 2~12 hour  |                               | O                             |   |   |   |   |   |        |        |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |         |         |  |  |  |  |  |  |                               |                               |  |  |  |  |  |  |   |   |
|   | PRESET ID OPERATION        | 02H | 1FH | 00H | *1H | *2H   | *1H<br>00H~FFH: PRESET No.0~255<br>*2H<br>00H:OFF, 01H:ON  |                               | O                             |   |   |   |   |   |        |        |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |         |         |  |  |  |  |  |  |                               |                               |  |  |  |  |  |  |   |   |

|          |                           |   |     |   |     |     |     |     |     |  |     |   |     |   |     |       |     |   |  |   |
|----------|---------------------------|---|-----|---|-----|-----|-----|-----|-----|--|-----|---|-----|---|-----|-------|-----|---|--|---|
|          | PRESET ID<br>MENU DISPLAY |   |     |   | 02H | 20H | *1H | *2H | *3H | *1H<br>00H~FFH: PRESET No.0~255<br>*2H (PRESET ID Sequence)<br>01H~0CH: 0 ~ 12<br>*3H (String)   |     |   |     |   |     |       |     |   |  | O |
|          |                           |   |     |   |     |     |     |     |     | *String Table  |     |   |     |   |     |       |     |   |  |   |
|          | 00H                       | A | 05H | F | 0AH | K   | 0FH | P   | 14H | U  | 19H | Z | 1EH | 4 | 23H | 9     | 28H | + |  |   |
|          | 01H                       | B | 06H | G | 0BH | L   | 10H | Q   | 15H | V  | 1AH | 0 | 1FH | 5 | 24H | space | 29H | * |  |   |
|          | 02H                       | C | 07H | H | 0CH | M   | 11H | R   | 16H | W  | 1BH | 1 | 20H | 6 | 25H | :     | 2AH | ( |  |   |
|          | 03H                       | D | 08H | I | 0DH | N   | 12H | S   | 17H | X  | 1CH | 2 | 21H | 7 | 26H | ?     | 2BH | ) |  |   |
|          | 04H                       | E | 09H | J | 0EH | O   | 13H | T   | 18H | Y  | 1DH | 3 | 22H | 8 | 27H | -     | 2CH | / |  |   |
| LANGUAGE | LANGUAGE SELECT           |   |     |   | 02H | 1EH | 00H | 00H | **H | NTSC-1 MODEL<br>00H: English, 01H: French<br>02H: Spanish, 03H: Japanese<br>04H: Portuguese<br>PAL-1 MODEL<br>00H: English, 01H: French<br>02H: German 03H: Spanish<br>04H: Italian<br>CHINA MODEL<br>00H: Chinese |     |   |     |   |     |       |     |   |  | O |
| CCD      | DEFECT<br>COMPENSATION    |   |     |   | 55H | 40H | 00H | 00H | 00H |  |     |   |     |   |     |       |     |   |  | O |



◆ Camera Inquiry Command

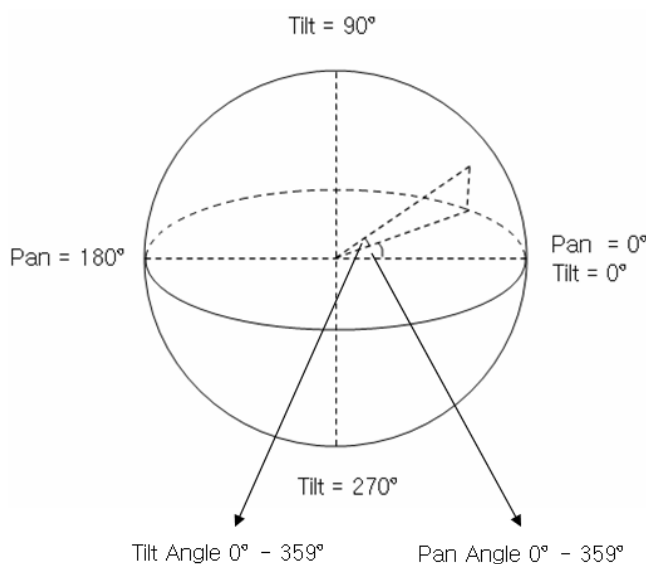
| Command                           |                                | Byte4                        | Byte5               | Byte6                | Byte7               | Byte8                | Items   |
|-----------------------------------|--------------------------------|------------------------------|---------------------|----------------------|---------------------|----------------------|---|
| ZOOM                              | POSITION                       | 50H                          | FFH                 | FFH                  | FFH                 | FFH                  | A0 00 00 70 ◆◆◆◆ ◆◆◆◆<br>"◆◆◆◆" Zoom Position value<br>"◆◆◆◆" DZoom Position value                |
|                                   | MAGNIFICATION                  | 60H                          | FFH                 | FFH                  | FFH                 | FFH                  | A0 00 00 60 00 00 ◆◆◆◆<br>"◆◆◆◆" Zoom Magnification value<br>: Return value (x1 ~ x468)           |
| FOCUS                             | POSITION                       | 63H                          | FFH                 | FFH                  | FFH                 | FFH                  | A0 00 00 63 00 00 ◆◆◆◆<br>"◆◆◆◆" FOCUS value  |
| AWC                               | DAY<br>RED,BLUE Gain value     | 61H                          | FFH                 | FFH                  | FFH                 | FFH                  | A0 00 00 61 ◆◆◆◆ ◆◆◆◆<br>"◆◆◆◆" Red Gain value<br>"◆◆◆◆" Blue Gain value                          |
|                                   | NIGHT<br>RED,BLUE Gain value   | 62H                          | FFH                 | FFH                  | FFH                 | FFH                  | A0 00 00 62 ◆◆◆◆ ◆◆◆◆<br>"◆◆◆◆" Red Gain value<br>"◆◆◆◆" Blue Gain value                          |
| BLC USER<br>AREA                  | Horizontal & Vertical<br>Value | 65H                          | FFH                 | FFH                  | FFH                 | FFH                  | A0 00 00 ◆◆◆◆ ◆◆◆◆ ◆◆◆◆   |
|                                   |                                | * ◆◆◆◆ Byte 4 ~ Byte 8 value |                     |                      |                     |                      |   |
|                                   |                                | Byte 4                       |                     | Byte 5               |                     | Byte 6               |   |
|                                   |                                | 7 6 5 4 3 2 1 0              | 7 6 5 4 3 2 1 0     | 7 6 5 4 3 2 1 0      | 7 6 5 4 3 2 1 0     | 7 6 5 4 3 2 1 0      | 7 6 5 4 3 2 1 0   |
|                                   |                                | Horizontal Start Point       |                     | Horizontal End Point |                     | Vertical Start Point |   |
|                                   |                                | 9 8 7 6 5 4 3 2 1 0          | 9 8 7 6 5 4 3 2 1 0 | 9 8 7 6 5 4 3 2 1 0  | 9 8 7 6 5 4 3 2 1 0 | 9 8 7 6 5 4 3 2 1 0  | 9 8 7 6 5 4 3 2 1 0   |
|                                   | Horizontal Value               | 66H                          | FFH                 | FFH                  | FFH                 | FFH                  | A0 00 00 66 ◆◆◆◆ ◆◆◆◆<br>"◆◆◆◆" Horizontal Start Point value<br>"◆◆◆◆" Horizontal End Point value |
|                                   | Vertical Value                 | 67H                          | FFH                 | FFH                  | FFH                 | FFH                  | A0 00 00 67 ◆◆◆◆ ◆◆◆◆<br>"◆◆◆◆" Vertical Start Point value<br>"◆◆◆◆" Vertical End Point value     |
| FILTER_<br>AUTO<br>MASK1_<br>AREA | Horizontal & Vertical<br>Value | 68H                          | FFH                 | FFH                  | FFH                 | FFH                  | A0 00 00 ◆◆◆◆ ◆◆◆◆ ◆◆◆◆   |
|                                   |                                | * ◆◆◆◆ Byte 4 ~ Byte 8 value |                     |                      |                     |                      |   |
|                                   |                                | Byte 4                       |                     | Byte 5               |                     | Byte 6               |   |
|                                   |                                | 7 6 5 4 3 2 1 0              | 7 6 5 4 3 2 1 0     | 7 6 5 4 3 2 1 0      | 7 6 5 4 3 2 1 0     | 7 6 5 4 3 2 1 0      | 7 6 5 4 3 2 1 0   |
|                                   |                                | Horizontal Start Point       |                     | Horizontal End Point |                     | Vertical Start Point |   |
|                                   |                                | 9 8 7 6 5 4 3 2 1 0          | 9 8 7 6 5 4 3 2 1 0 | 9 8 7 6 5 4 3 2 1 0  | 9 8 7 6 5 4 3 2 1 0 | 9 8 7 6 5 4 3 2 1 0  | 9 8 7 6 5 4 3 2 1 0   |
|                                   | Horizontal Value               | 69H                          | FFH                 | FFH                  | FFH                 | FFH                  | A0 00 00 69 ◆◆◆◆ ◆◆◆◆<br>"◆◆◆◆" Horizontal Start Point value<br>"◆◆◆◆" Horizontal End Point value |
|                                   | Vertical Value                 | 6AH                          | FFH                 | FFH                  | FFH                 | FFH                  | A0 00 00 6A ◆◆◆◆ ◆◆◆◆<br>"◆◆◆◆" Vertical Start Point value<br>"◆◆◆◆" Vertical End Point value     |
| FILTER_<br>AUTO<br>MASK2_<br>AREA | Horizontal & Vertical<br>Value | 6BH                          | FFH                 | FFH                  | FFH                 | FFH                  | A0 00 00 ◆◆◆◆ ◆◆◆◆ ◆◆◆◆   |
|                                   |                                | * ◆◆◆◆ Byte 4 ~ Byte 8 value |                     |                      |                     |                      |   |
|                                   |                                | Byte 4                       |                     | Byte 5               |                     | Byte 6               |   |
|                                   |                                | 7 6 5 4 3 2 1 0              | 7 6 5 4 3 2 1 0     | 7 6 5 4 3 2 1 0      | 7 6 5 4 3 2 1 0     | 7 6 5 4 3 2 1 0      | 7 6 5 4 3 2 1 0   |
|                                   |                                | Horizontal Start Point       |                     | Horizontal End Point |                     | Vertical Start Point |   |
|                                   |                                | 9 8 7 6 5 4 3 2 1 0          | 9 8 7 6 5 4 3 2 1 0 | 9 8 7 6 5 4 3 2 1 0  | 9 8 7 6 5 4 3 2 1 0 | 9 8 7 6 5 4 3 2 1 0  | 9 8 7 6 5 4 3 2 1 0   |
|                                   | Horizontal Value               | 6CH                          | FFH                 | FFH                  | FFH                 | FFH                  | A0 00 00 6C ◆◆◆◆ ◆◆◆◆<br>"◆◆◆◆" Horizontal Start Point value<br>"◆◆◆◆" Horizontal End Point value |
|                                   | Vertical Value                 | 6DH                          | FFH                 | FFH                  | FFH                 | FFH                  | A0 00 00 6D ◆◆◆◆ ◆◆◆◆<br>"◆◆◆◆" Vertical Start Point value<br>"◆◆◆◆" Vertical End Point value     |
| INTELLI-<br>GENCE                 | ALARM State                    | 6EH                          | FFH                 | FFH                  | FFH                 | FFH                  | A0 00 00 6E 00 00 00 ◆◆◆◆<br>"◆◆◆◆" : 00 → ALARM OFF<br>"◆◆◆◆" : 01 → ALARM ON                    |

◆ **Pan/Tilt angle decide the privacy area display ( NO Ack. Signal )**

| Command  |       | Byte4                                       | Byte5 | Byte6                | Byte7 | Byte8                                      | Items   |
|----------|-------|---|-------|----------------------|-------|--|---|
| PAN/TILT | ANGLE | 02H   | 25H   | **H                  | **H   | **H  | Received the current pan/tilt value, the privacy zone display area will be changed automatically. |
|          |       | * Byte6 ~ 8 value                           |       |                      |       |  |   |
|          |       | Byte6                                       |       | Byte7                |       | Byte8                                      |   |
|          |       | pan_high<br>(bit 5~12)                      |       | pan_low<br>(bit 1~4) |       | tilt_high<br>(bit 5~12)                    |   |
|          |       |   |       |                      |       | tilt_low<br>(bit 1~4)                      |   |
|          |       | Pan input range<br>0 ~ 3590 (0X000 ~ 0XE06) |       |                      |       | Tilt input range<br>0~3590 (0X000 ~ 0XE06) |   |

※ When Pan/Tilt angle is changed, always send the Pan/Tilt angle to ZM395 set.  
Because the privacy zone need the current Pan/Tilt angle to display when you set the privacy zone.  
Use the protocol is like the above.

ex) when the Pan angle is 180° and Tilt angle is 30°, send the protocol is like : 02 25 70 81 2C.



Pan Angle input range: 0° - 359° => 0 - 3590 (0X000H -- 0XE06H)  
Tilt Angle input range : 0° - 359° => 0 - 3590 (0X000H -- 0XE06H)